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A Brief Survey of Sero-vaccine Therapy: Its Application in General Practice.*

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In the selection of a subject suitable to read before an Association such as this, one has an enormous field from which to choose, but it is this enormity, paradoxical as it may seem, that adds to, rather than detracts from, one's difficulty in this matter of selection. I have therefore fallen back upon an acid test axiom, and chosen a subject with which we as practitioners must all come in contact, in our daily work, for each one of us, consciously or unconsciously, is an immunologist. However, having decided upon a subject, suitable perhaps to the majority, the essayist is confronted with the problem as to how best to elaborate and present his theme. To give a theoretical exposition and leave it at that, would indeed be placing before a body of practical men the shadow for the substance; nevertheless, theory is the handmaiden of sound practice. I propose, therefore, to give a brief dissertation of the elementals of sero-vaccine therapy, and then endeavour to enlarge upon their application in practice.

Historic. The whole science of sero-vaccine therapy is bound up in one word—immunology. To the average enquirer this will probably be looked upon as one of the latter day sciences, but a moment's consideration will show that it is one of the oldest, for does it not date back to the period when the first pathogenic organism waged war against the defensive factors of the animal body, when the first dog licked his septic wound, and the first man swallowed his germ-laden expectorate—with the consequent elaboration of immune bodies? And if we look into the records of the ancients, we find that Hippocrates was wont to say that the factor which produced disease was able to cure it, on the lines of the homœopathic doctrine of "*Similia similibus curanter*," while Pliny recommended the livers of rabid dogs as a treatment for rabies, coming very near to Pasteur's basic discovery, and it is recorded that a king of Pontus, who lived 120 B.C., immunised himself against toxic poisons by drinking the blood of ducks previously treated by the corresponding toxin. Tropical savages were known to immunise themselves against venomous poisons from the earliest times, and oriental races practised inoculations against smallpox by exposing subjects mildly affected

It was left, however, to Edward Jenner to raise vaccine therapy from the depths of empiricism to a scientific level by his discovery of protecting man against smallpox with the virus of cowpox. From Jenner's time until Pasteur's epoch-making discovery of 1880 little progress was made. In that year Pasteur accidentally discovered, in working with the germs of fowl cholera, that if he sowed the organisms regularly every twenty-four hours they retained their virulence and would cause the death of fowls if inoculated, but if hens were vaccinated with old cultures they became ill, and then recovered, while it was further proved that if those refractory hens were now inoculated with young and virulent cultures they would not die. In short, they had acquired an active immunity.

About this period, anthrax in France was an epizootic disease, farmers losing about 50% of their stock. Pasteur set about attenuating the bacillus and succeeded in producing immunity. Before the Melini Agricultural Society he took twenty-five sheep and cattle and inoculated them with prophylactic vaccine on two occasions. Fourteen days later, those animals and a similar number of controls (untreated) received a lethal dose of live germs, with the result that the immunised animals survived and all the others died. And so, too, some five years later, he treated his first man with modified rabies virus.

Pasteur was neither a doctor nor a veterinary surgeon, but his incursions into the realm of comparative pathology link this great genius closer to us than to our medical confrères, a fact of which we should feel justly proud.

The foundation so well and truly laid by Pasteur was slowly and surely built upon by, just to mention a few: Koch in his work upon tuberculosis; Metchnikoff on phagocytosis; Ehrlich in his hypothetic side-chain theory; and lastly Wright—an honorary member of this Association—in his opsonic doctrine. The cumulative result of these labours is that to-day for the majority of bacterial infections there is, both for man and beast, an antidotal serum or vaccine.

Immunity.

There are many kinds of immunity, but the two principal ones which concern us here are natural and acquired.

Natural immunity. This condition is seen in certain species of animals; thus, cattle are immune to glanders and Algerian sheep to anthrax.

Acquired immunity. We have here two distinct kinds, active and passive.

Active acquired immunity. This is a definite power established within the animal body to resist infection consequent upon the active stimulation of the protective body forces induced by the presence of a bacterial infection or the artificial inoculation of an antigen.

Thus active acquired immunity may follow upon the train of a bacterial infection, or it may be brought about by the injection of a vaccine or antigen.

Passive immunity. As the term implies, this condition is produced without the active intervention of the defensive body factors, the immunity here being acquired by the injection of serum obtained from an animal which has been previously rendered hyperimmune.

Passive immunity is usually of short duration but, being passive in action, it does not strain the defensive forces, so to speak, hence it is most useful in acute infections where nature has put up a bold fight and is well-nigh

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exhausted through the bacteria or their toxins having run riot.

ACTIVE IMMUNISATION ACTION BY VACCINES.

A vaccine is a suspension of bacteria, usually in normal saline solution, they having been previously destroyed by heat or chemicals.

They are divided into stock and autogenous. A stock vaccine is derived from *materies* other than the animal into which it is inoculated, consequently it may or it may not contain the bacterial elements akin to those infecting the case. Stock vaccines have, therefore, an empirical, inexact element about them which cannot be overlooked.

Autogenous vaccines, on the other hand, as the term implies, being derived from the animal itself, are exact and specific, and, as such, in practice I prefer them to the former, where possible. To be a successful immuniser one should be able to interpret the signs and symptoms following upon immunisation. Take, for example, a case of pneumonia.

Following upon the injection of a vaccine an exaggeration of the focal and general symptoms occurs; respiration increases and also the heart beat; the temperature rises. This retrogressive process goes on for a matter of six, twelve to twenty-four hours usually, and then gradually subsides. This is known as the negative phase, during which period there is a gathering together of the defensive forces, owing to antigenetic stimulation, the opsonic index falls, and the infective organisms are on the ascendant. This is followed by the outpouring of the animal bodies into the lung tissue.

The defensive mechanism has become activated and the aggressive ascendance of the focal bacteria—if the case progresses favourably—is checked. This is known as the positive phase, which usually lasts two or five days, after which defensive exhaustion may occur, necessitating another injection.

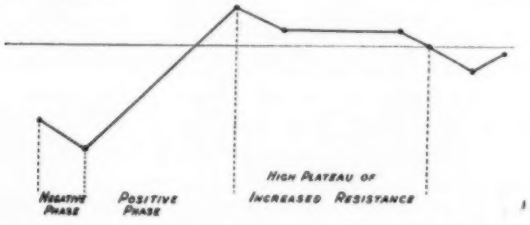

CHART SHOWING THE EFFECTS OF A SUITABLE DOSE OF VACCINE.
(*From the Author's "Clinical Bacteriology and Vaccine Therapy."*)

Where one is dealing with a local chronic condition, such as fistulous withers, no constitutional phenomena follow the vaccine if the dose is right, but the focal signs are present. The negative phase is noted by hyperæmia of the part, and if pus is discharging there is an increase

Then follows a decrease of these symptoms, the positive phase. The pus in these cases offers a valuable index of the progress or otherwise of the case. Prior to injection the pus is probably thin, watery, grey in colour, and non-adhesive in character, showing a deficient bacteriotropic power. In other words, the bacteria are on the ascendant, and the immunising mechanism is dislocated. The vaccine should alter all this, the pus becoming creamy, thick, and adhesive, due to the increased presence of pus cells which have fallen in the fight, while the immune serum possesses more "body." I often think we clinicians are behind our forefathers in interpreting the character of pus as an index of the progress or otherwise of our suppurating cases, for they certainly divided pus into two classes: "*laudable*" or healthy, and unhealthy, and they knew that so long as pus remained "*laudable*," blood poisoning, or what we call septicæmia, would be kept at bay, although they did not know the nature of these complex defensive factors of the body which were keeping the bacterial content at bay. They were ignorant of the fact that following upon a bacterial infection or, as we know now, the injection of a vaccine, immune bodies increase in the blood which autogenise, neutralise, or destroy invading bacteria or their toxins; the best known of these being the *opsonins*, which prepare the bacteria for their destruction by the leucocytes; *agglutinins*, which clump the bacteria; *precipitins*, which cause their precipitation in suspension; *bacteriolysins*, which destroy bacteria and render them soluble, while the *antitoxins* combine with and render neutral the toxins.

DOSAGE. It is a safe axiom to follow in acute infections, always to begin with the minimum dose, while in chronic conditions the *optimum* is called for. The aim of the immuniser is to produce a reaction, but not to excess, and its appearance is an indication that the antigen is an efficient one. It is also evidence of the ability of the tissue cells to combat the infection under the stimulus of the vaccine.

In acute infections small doses, repeated fairly often, usually every two or three days, are advised, and as the case progresses the interval and dose should be increased. In chronic conditions large doses are indicated, and I usually advise injection every five or seven days. It is astonishing how large a dose of vaccine our patients will take without producing any harmful phenomena, and in all my experience I have never seen a case of anaphylactic shock such as is met with in man—our patients seeming to be more insusceptible.

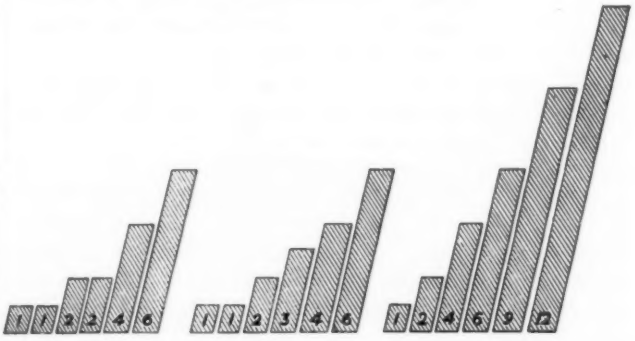

DIAGRAM SHOWING THE PROPORTIONAL RATIO OF DOSES OF VACCINE TO BE USED IN (1) ACUTE; (2) SUB-ACUTE; (3) CHRONIC DISEASE.
(*From the Author's "Indexed System of Treatment."*)

The Treatment of Bacterial Emulsion.

I mentioned just now that a vaccine was a bacterial emulsion, the germs being killed by heat or chemicals; consequently, it is sterile. In the process of destruction

a change in the bacterial content must follow which I am quite sure detracts from its antigenic qualities. For some years I have in selected cases used attenuated vaccines and sometimes the virus itself untampered artificially, with good results. I know these findings do not obtain in human practice, and I question if any medical man would have the courage to inject *subcutis* into his patient, say, a streptococcal virus. Be this as it may, after considerable experience I have no hesitation in saying the attenuated culture or the active virus has never lost me a single patient or caused me a moment's anxiety, and I am quite sure by doing so I have enhanced the therapeutical value of vaccines in my hands.

Channels of Administration.

The usual method is by subcutaneous injection, while some prefer the intramuscular route. Recently intradermal injections in selected cases have been advised, and I have practised skin scarification (cuti-vaccination) for some years with good results. This latter observation is based upon the researches of Besredka, who brought to light a new conception of the mechanism of infection, and the nature of immunity on the part of the skin. He showed that if a virulent culture of anthrax was rubbed into the shaved skin of a guinea-pig the animal died in three or four days, but if an attenuated culture was used the animal became ill, but lived and, further, a considerable degree of immunity was acquired, for it would now survive the application of a virulent culture. It was further proved, and this is of practical importance, that the skin became immune all over the body, the local immunity appearing to radiate throughout the whole cutaneous structure. It was also proved that the skin is the channel of infection in all anthrax cases, and as the mucous membrane is the inward continuation of the skin the same condition obtains here also. These observations were extended to other bacteria affecting the skin and mucosæ and the same conclusions were arrived at. It will be gathered, therefore, that in cuti-mucosal infections cutaneous vaccination is a valuable asset in the immunising rôle.

Passive Immunisation by Sera.

We come now to consider, briefly, serum therapy. As you are aware, these biological products are obtained by injecting animals (usually horses) with gradually increasing doses of the virulent causative agent of the disease, and when the animal has attained a high degree of toleration it is bled, and the collected sterile serum is the hyperimmune agent. This serum confers a given degree of immunity, but unfortunately it is of short duration,—usually ten days to three weeks. Sera, however, have a great advantage over vaccines inasmuch as they do not tax the body resources, and when the disease is a very acute one, or the patient is very weak, the gain is obvious. Prolonged immunity can always be obtained, however, by following up the serum injection by a vaccine, while in other cases the simultaneous method may be practised. By that is meant the conjunction of serum with virus as, for example, in hog cholera. The sera in most common use in practice are avian cholera, polyarthritis, anti-streptoccal sera, swine erysipelas, white scour serum, anti-tetanic serum, blackleg serum, purpura hæmorrhagica serum.

Collateral Treatment.

I find that among some practitioners there is an ingrained idea, in connection with the use of sera or vaccines, that if they inject a suitable biological product into their patient it, and nature, will do the rest. In other words, masterly inactivity is their motto and motive. Now this is all wrong: vaccine therapy is a most valuable asset in skilled hands, but he who thinks it a miracle worker, I fear, will be sadly disappointed. The following examples will illustrate my point. Take an animal suffering from an old-standing, discharging wound, such as fistula of the poll or withers. As a result of a long-standing bacterial warfare the surrounding tissue cells are activated, and a pronounced fibrosis follows, while the walls of the sinus have become indurated. In such a case it is impossible for the bacteriotropic serum to filter through or the scavenging phagocytes to reach the infective foci. Clearly, in such a case, surgery must go hand in hand with the vaccine treatment, by a free use of the curette and lancet. Again, drainage is of first importance, for pus has a powerful tryptic action and, if not removed, burrows into healthy tissue, extending the diseased area.

Further, be it remembered, pus is an inflammatory by-product, dead and useless, and hence must be removed if the surrounding tissues are going to be restored to normal. Drainage is, therefore, imperative, and that vaccine therapy cannot accomplish. Or take a condition where there is a deep bacterial involvement and consequent toxæmia; putrefactive and fermentive changes take place in the intestines, which irritate the mucosæ and set up diarrhœa, which is really Nature's effort to rid the bowel of an irritant and which, if the practitioner is thoughtful, he will have foreseen by administrating a laxative followed by intestinal antiseptics, of which there are none better than the sulpho-carbonates and small doses of calomel.

Still further to reduce the auto-intoxication, the skin and kidneys require careful attention, and here diaphoretics and diuretics are indicated. Or take a case of pneumonia where the blood vessels of the lungs are gorged to bursting point; where oxygen starvation is reached, where the right heart is blocked with impure blood, and the left is tired out by pumping blood at well-nigh coagulation point under pressure. In such a case one must keep the heart going by tonics and stimulants by administrating vaso-dilators and by retarding coagulation with decalcifying agents.

Clinical Considerations.

With these observations I conclude the more academic side of vaccine therapy. Let us now see how we may, with advantage, apply it in practice. For purposes of clarity, I propose discussing a few of these bacterial diseases which affect the various systems.

Cutaneous System.

Here we find abscess formations, infective wounds and fistulæ and, as the underlying principle of treatment is identical, these may be treated as one. The most common bacteria invading these parts are streptococci, staphylococci, *B. coli*, *B. pyocyaneus*. A microscopical examination of the pus soon reveals the bacterial content, and from this a vaccine should be prepared. As these are usually chronic conditions the doses should be large. I invariably begin

with a sterile vaccine, and if the case does not respond I switch on to the attenuated, and even the active virus itself. If the case is old standing the cavity-wall must be curetted, after which I irrigate with a 3% solution of citrate of soda and a 5% saline solution, and then pack with gauze soaked in normal saline. Where antiseptics are used they must be of the non-coagulating albumen kind, and weak at that. If the case does not respond to treatment, depend upon it one of three things is present—either dead tissue or a foreign body, or the drainage is defective, in which case surgical interference is necessary.

Interdigital Cysts in Dogs. This troublesome complaint responds very kindly, as a rule, to vaccine treatment, but the actual bacteriology does not appear to have been fully worked out, and I have met, on many occasions, an unclassified bacillus, but whether this is a causative or an accidental one I do not know. *Staphylococcus albus*, aureus and citreus are invariably present, and also streptococci. Owing to the variable nature of the infection, I do not think a stock vaccine is of much use here.

The dog should be vaccinated every six or seven days, and where the abscess is closed it should be opened and, if painful, the whole foot placed twice daily in a hot bath containing a solution of sodium citrate and sodium chloride. In obstinate cases I have found Bur's treatment will do much good. As a prophylactic in these cases, in addition to vaccination I advise painting between the digits a solution of tincture of iodine and sulpho-carbonate of zinc, the object being to sterilise and harden the skin.

Follicular Mange in Dogs. Of all the skin infections of the dog, I think you will agree this is our *bête noir*. In the early stages I give it as my opinion that the acarus holds the field, but very soon it acquires an accessory in the staphylococcus and streptococcus, and these pus-producing organisms soon gain the ascendancy over the acarus, so that at the end phase of the disease, at least, their pathogenic powers are negligible. By this time the bacteria have run riot, and instead of their field of activity being local, as is obtained in most pus-producing affections, it becomes diffused, and I cannot think that the acari are wholly responsible for this.

What, then, is ? As you are aware, as soon as a superficial pus centre develops a migration of leucocytes and tissue cells takes place. These proliferate with great energy and eventually a ring wall is formed round the area inclosing the infective zone. Now, pus contains a powerful ferment called trypsin, derived from dead and disintegrated leucocytes, which is responsible for its burrowing power, but, as if nature was not to be thwarted, she immediately goes about preparing an antidote in the shape of anti-trypsin, which is found in the serum and oozes through by a process of positive chemotaxis and neutralises the pus tryptic content. This may be a hypothetical view to hold in the spread of follicular mange, but to me at least it appears logical. It might also explain why it is that follicular mange is so slightly infectious, and those animals which do become infected are possibly deficient in anti-trypic response. I think it might also explain why it is that some dogs act as hosts and carriers to the acarus without manifesting the disease. Of course, this point could be cleared up by estimating the anti-tryptic power of the blood in these cases. In using vaccine in advanced cases the immuniser must bear in mind that there is a certain degree of auto-intoxication present. Owing to the disintegration of the skin, diaphoresis can only be slightly performed, which means that more work is thrown upon the bowels and kidneys and then there is a certain degree of auto-intoxication to consider. The doses should, therefore, be small at the outset, and given once weekly, gradually increasing as the case progresses. In addition, I have considerable faith in that arsenical preparation cacodylate of sodium, one to four grains, injected daily for three days, and then every other day. This preparation goes well, too, with vaccine treatment. As regards the collateral treatment, I am averse to heroic measures. I order the patient a bran, sulphur, and creta. prep. bath once a week. For local treatment I favour the application of an ointment known as ung. iodin. grescius. It is composed of iodine, oleic acid, paraffin, and I add to that lactate of calcium. This should be applied every day, and one quarter only of the body should be dressed at a time.

In most of these cutaneous affections, in addition to the subcutaneous injections I practise *cuti-vaccination* also. The method I adopt is as follows :—

In the horse I shave the skin of the neck over an area about six inches in diameter, rub with ether, and then with a piece of pumice stone. The vaccine is now lightly applied and repeated usually once a week, of course a different site being chosen for each vaccination. In the dog the skin on the inside of the thigh is the best situation and here, instead of using pumice stone, slight cross scarifications with a lancet will serve the purpose.

Respiratory System.

The bacteriology of the diseases of the respiratory system has never been fully worked out, and so nebulous, indeed, is the subject that our leading text books of to-day define what are really exciting causes, for actual ones—for one reads, " the causes of pneumonia are chill, exposure, bad food effects."

Animals, and man also, harbour saprophytic bacteria in the upper air passages, which at any moment are ready to become parasitic when the right time for their aggression arrives. I look upon every respiratory condition as bacterial in conception, whether it be a simple catarrh, an involved bronchitis, a pneumonia, a pleurisy or an empyæma. The most common organisms found are *streptococci brevis* and *longus*, pasteurella, micrococci very much like the *micrococcus catarrhalis* in man, and diplococci. To collect *materies* for the making of a vaccine a swab is inserted into the posterior nares, but in those cases where the lungs are involved lung puncture is desirable. This is quite a simple operation. A sterile syringe with a long needle and charged with 1 to 2 c.c. nutrient broth is all that is required. The skin over the intercostal muscle is shaved and sterilised and the needle is plunged through the chest wall into the lung tissue and the broth injected. It is then aspirated, and the collection placed in a sterile tube and used for cultural purposes.

In acute pulmonary conditions the dosage should be small at the outset, and it may be usefully combined with an appropriate serum. As regards collateral treatment, the practitioner must ever have in mind the element of *toxaemia*, its accumulative tendencies, and its disastrous consequences, and keep the three great excretory systems

well flushed. There is one point, however, I would like to emphasise here to the younger practitioners, and that is, never drench a horse or an ox with acute pulmonary diseases. I am firmly convinced there are more deaths caused by drenching than are ever saved by it. Far better results are obtained by giving medicine in food or in water or on the tongue. I also place great reliance upon normal saline solution, and a horse may be given a gallon subcutaneously with impunity. As an adjuvant to the vaccine, I use cacodylate of sodium. In the early stages a counter irritant to the chest is advisable. Our forefathers practised this on the principle that no two inflammations could exist in the body at the same time. Our present-day interpretation is that a blister produces hyperæmia, that is, a throwing-out of serum, an activation of connective tissue cells, and a migration of leucocytes, rich immunising elements. Those, in turn, are taken up by the circulation, and reach the infective foci like a battalion of fresh soldiers arriving at a battle centre.

In like manner, "fixation" abscess serves a good purpose. This is produced by injecting 10 to 20 cc. of turpentine subcutaneously over the shoulder blade in the horse and 1 to 2 c.c. in the dog.

Mastitis. To the bovine practitioner, diseases of the mammary gland are of first importance, and of these mastitis heads the list. As with diseases of the respiratory system, so, too, with the lacteal organ—bacteriological classification is still far from being perfect. Out of the haze, however, and gathered from considerable experience in the matter, I would suggest the following classification. I think bacteriologist veterinarians are justified in placing mastitis under two distinct heads:—

I. *The parenchymatous* type usually seen in dry cows, and heifers at grass, the organisms present being the *Bacillus bovisepticus, Bacillus coli communis* and occasionally *Streptococcus pyogenes* and *Bacillus pyocyaneus*. The secretion here is foul-smelling, watery at first, then purulent, and grey or green in colour.

II. *The catarrhal form*, usually seen in cows in full milk, is caused by the streptococcus and *Agalactus longus, Bacillus abortus* of Bang, staphyloccus and *Bacillus coli communis*. Owing to the number of pathogenic organisms engaged in these attacks, it is obvious that stock vaccines in mastitis are of uncertain value. Further, where active bacterial aggression has taken place, the udder is the most ideal organ for germinal activity, the organ, of itself, being an ideal incubator, supplying heat, moisture and nourishment to perfection. Can it be wondered at, then, that in a bacterial attack the germs soon run riot and, further, owing to the small canals and *culs de sac*, bacterial housing is almost perfect, which, on small consideration, points to the futility of mammary injections with antiseptics. It must be conceded, therefore, that curative measures have their limitations, and that prophylaxis is, in the end, the most economical.

Where an outbreak occurs in a herd, a sample should be taken from each affected cow, bacteriologically examined and cultures made. I then inject the virus into each healthy cow, beginning with a minimum dose and increasing it weekly, giving three injections in all. Cuti-vaccination should also be practised. If curative measures are called for, in isolated cases, I prefer to begin by giving sera and then sera and vaccines, coupled, of course, with the usual local and systemic palliative measures.

Specific Infections.

Distemper. As the brilliant research work of Laidlaw and Dunkin is still fresh in your minds, I need only make a passing allusion, and if the immunity should prove to be a permanent one, this, the greatest of all canine scourges, will have incurred its death warrant. I might mention here, in passing, that I am making arrangements to immunise pregnant bitches with a view to conferring immunity upon their offspring, but whether this will give good results remains to be seen.

Strangles. I do not know if your experience coincides with mine, but I do not see as many cases as I used to do, even making allowance for the depleted horse population. It almost seems as if the disease is dying a natural death. Strangles, running a normal course, is a mild disease, and it is only when complications set in that loss of life is entailed; nevertheless, in the case of bloodstock and hunters the owner cannot afford to overlook it. Strangles is, in my opinion, the root cause of most of our roaring cases and, as such, should be thwarted if possible. There is no reason why a young horse should develop strangles any more than a dog should contract distemper or a child measles. Where the disease breaks out in a valuable stud prophylactic immunisation is called for. *Materies* is taken from the infected case, and from this a vaccine is prepared. In these cases I generally give three doses, the first being a dead culture, the second attenuated, and the third the streptococcal virus. In those cases running an acute and irregular course begin by giving a full dose of anti-streptococcal serum, and then start with small doses of vaccine guarded with serum.

Joint-evil in Foals. Speaking for those to whom I have supplied the vaccine from time to time, and from my own experience, I think we may now safely claim an almost complete immunity for the equine offspring against specific polyarthritis. The three primary organisms involved are the *Streptoccus longus et brevis, Bacillus pyosepticus*, and *B. coli*. From these a vaccine is prepared and injected into the pregnant mare, once a week, with three injections in all. I prefer beginning about the first week of the seventh month. Where the foal is a valuable one, I strongly advise 10 cc. of a polyvalent serum to be injected at birth, and again at a week old. Of course, the usual prophylactic measures of dressing the navel should not be overlooked. Curative measures are not so satisfactory. These consist of large doses of polyvalent sera repeatedly injected, but where the disease becomes established the foal seldom ever becomes a sound proposition.

Purpura hæmorrhagica or Petechial fever. This is not an uncommon sequel to low fevers and unfortunately it is not a disease over which chemo-therapy exercises much influence. Save for keeping the eliminative organs free and sustaining the strength by good food, little can be done. Of recent years a polyvalent anti-streptococcal serum has been prepared, which is now the most valuable therapeutical asset we possess, but the treatment should be undertaken as early as possible, and the doses should be large.

Nothing short of 50 cc. to 100 cc. should be injected into the jugular vein every twenty-four hours for three

or four days. It may not be out of place here to warn young practitioners not to lance the œdematous swellings in purpura, owing to the sloughing and tardy healing of the wounds afterwards.

White scour (Infections) in Calves. In some herds this is a very serious complaint, and in some outbreaks I have treated these cases on the same lines as in joint evil in the foal, *i.e.*, by establishing maternal hyperimmunity and through it that of the fœtus, by the injection of a vaccine composed of *B. coli*, *B. enteritidis* and *B. ærogenes*. As soon as the calf is born it is injected with an immune serum, repeated in seven days, the dosage being 10—15 cc. at each injection.

Johne's disease. Unfortunately, this is a slow and insidious disease, and by the time clinical data are observed considerable gross lesions in the bowels have taken place, which do not lend themselves kindly to treatment. For the last six months or so I have been working on a line of treatment which may bear good fruits. The time is too short and the cases too few to allow one to dogmatise, but I will mention briefly the course I have adopted.

I take a piece of diseased bowel and pass it through a mincer, catching all the fluid in the process. This product is macerated in antiformin. The mass is then filtered through muslin and bottled. This extract is given to the cow on an empty stomach, with a dose of ox bile, once daily for a week, while twice weekly hypodermic injections of the same extract are given, and once weekly cuti-vaccination is practised. I may add that by adopting the method I am following upon Besredka's line of immunising the skin and mucosæ, and the five cases treated thus have given an apparent three recoveries and two failures. I feel sure, however, that to get results at all, treatment must be undertaken early.

Epizootic Abortion. As regards prophylactic vaccine treatment of this disease, there are two schools of thought: one holds that the only method is by inoculation with the active virus—which has its limitations, as you know—while the other, and its adherents are in the minority, assert that vaccine treatment is effective. I have used the killed and attenuated vaccine on very many cases for several years, and I assert that I can bring forward strong circumstantial evidence to show that it does succeed in shortening an outbreak of abortion, but I would like to add, nothing short of heroic doses are of any use. I am convinced, however, that no vaccine or sero-vaccine possesses any curative value.

Discussion.

The President (Mr. R. W. Hall): You will agree, I am sure, that it is with the greatest of pleasure that we have listened to Mr. Scott's able address. It is only what we expected from him, and I believe that the gentleman who is to open the discussion will give us as much instruction and material of interest as Mr. Scott has done. I will now call upon Captain Atkinson.

Captain G. Atkinson: I feel highly honoured in being asked to open the discussion on a paper by Mr. Scott before this meeting. I must thank Mr. Scott for giving us a very interesting paper and congratulate him on producing such a comprehensive one on a vast subject in the time at his disposal here. The general impression one gets on hearing the paper is this. This form of treatment is all very nice and straightforward, given reasonable care in diagnosis and observation, and it ought to put an end to many of our troubles if it is properly carried out. How is it, then, that results are not always successful? I would like to dwell on the other side of the picture for a moment or two.

There is probably no branch of veterinary science in which so many factors are encountered which militate against successful results. Bad results may be obtained owing to the fact that the outbreak of disease which is being dealt with is due to a particularly virulent strain of the causal organism, whereas the vaccine or serum used is designed to immunise against an organism of only average virulence. Particularly susceptible animals may react severely to vaccine treatment or even die. Animals which it is impossible to immunise have not been unknown. Stock cultures kept for the production of vaccines and hyper-immunising of serum producers often become rapidly attenuated in sub-culture and lose their virulence and antigenic power, and fresh cultures have to be obtained and carefully tested for these qualities. At every stage of the production and administration of vaccines and serums contaminating organisms are ready to invade the material and grow rapidly. They may be harmless but, on the other hand, they may cause abscesses or septicæmia and, in certain cases, they may neutralise the virulence of the vaccine. For example, it is well known that *B. pyocyaneus* and *B. subtilis* are antagonistic to the anthrax bacillus. In his report on the examination of commercial vaccines in Chili, Descazeaux says that contaminating organisms sometimes cause a marked reduction in the virulence of anthrax vaccines, and some vaccines containing *B. subtilis* are entirely avirulent. In some diseases there is more than one strain of the causal organism and the animal immune to one strain is not resistant to another. Exact diagnosis is not infrequently a matter of great difficulty in bacterial diseases, and the selection of the outbreak or animal suitable for treatment is often a matter of nice judgment. In administering the serum or vaccine the practitioner is frequently handicapped by filthy surroundings, inadequate assistance, and restive patients. These are a few of the variable factors which influence the results of serum and vaccine therapy and it is not surprising that owners of animals are sometimes disappointed and that vaccine therapy has not justified the optimism of early enthusiasts.

I would like now to criticise some of the statements in the paper. Mr. Scott says that Algerian sheep are naturally immune to anthrax. I have no personal knowledge of Algerian sheep, but in the *Arch. de l' Inst. Past. d' Algérie*, 1926, v. 4, p. 580, there is an account of the vaccination of Algerian sheep against anthrax in which the authors say that the intradermal inoculation of a single dose of 0·2 c.c. of Pasteur's second vaccine confers a high degree of immunity.

In view of the modern acceptance and application of the term, I think Mr. Scott's definition of a vaccine might be amplified a little. I would suggest this: "A vaccine is a suspension, usually in normal saline solution, of a pathogenic micro-organism which has been, in most cases, attenuated or killed by heat or chemicals or by cultivation in an abnormal medium."

In the immunisation of animals against disease vaccines are extremely valuable and, on the whole, give satisfactory results, but I must confess that I am somewhat sceptical as to their value in the treatment and cure of disease. I know that, theoretically, they are said to give an additional stimulus to the production of antibodies, but surely in the case of, say, an abscess or fistula the millions of organisms present in the lesion give all the stimulus that is required, and in the case of a condition like pneumonia the animal must have quite enough to do to cope with the organisms in the lung without the introduction of more at another point in the body. Does it not frequently happen that the animal recovers in spite of the vaccine and the recovery is credited to the vaccine? Mr. Scott himself says that surgical and general medicinal treatment are essential, in addition to the vaccine. The practice of injecting an unattenuated culture of live organisms into an already diseased animal is certainly an heroic one, and I think Mr. Scott must have been fortunate so far in meeting com-

paratively benign pathogenic organisms. In the very acute specific diseases it is certainly as good a method as any of killing the animal. There is no means of knowing to what extent the organisms are going to multiply within the body and, as I said before, the animal has quite enough to do on the main battle front without being called upon to meet a flank attack.

In Besredka's theory, Mr. Scott introduces a very controversial subject, and a long paper could be read on this alone. Suffice it to say that, judging from the mass of conflicting results obtained in experimental work on this subject, it would appear that in certain diseases the skin is the most susceptible channel of infection. By the way, in intradermal inoculation I prefer to use a small syringe. The dose can be controlled better and there is less chance of accidental infection than in scarification. With regard to anaphylaxis, two gentlemen named Melanidi and Mylianopoulo reported in 1927 in the *Rev. Gén. Méd. Vét.*, v. 37, p. 312, that, using equine anti-anthrax serum they encountered anaphylactic shock in cows which had been treated with serum six months previously. They all recovered in an hour. The symptoms were restlessness, kicking, gnawing, scratching, intense congestion of the skin and mucous membranes, lips of the vulva œdematous, and defæcation frequent. Perhaps Mr. Scott would tell us if he has had any experience of the use of bacteriophage in intestinal diseases. I believe Daubney had encouraging results with this line of treatment in white scour in calves a few years ago.

I would like to amplify a little Mr. Scott's remarks on specific infections.

With a few exceptions, the more destructive of the animal diseases are being brought under control. Such diseases as rinderpest, pleuro-pneumonia, hæmorrhagic septicæmia and piroplasmosis can all be controlled by immunising methods. Animals can be vaccinated against rabies, although the vaccination is not yet sufficiently reliable for adoption in a country which is entirely free from the disease. Swine fever seems to be controlled very well in the United States of America, although they occasionally have unfortunate accidents, known as "vaccination breaks," which are very well discussed by Benner in an article in the *Journ. Amer. Vet. Med. Ass.*, vol. 71, p. 58. In this country pigs are kept mostly in very small herds and, with the present method of control, swine fever never spreads sufficiently to be a serious menace to the pig population.

Unfortunately, nearly all the destructive animal diseases in this country cannot yet be controlled by immunisation. The B.C.G. vaccine against tuberculosis promises to be as great a benefit to mankind as Jenner's smallpox vaccine and similar epoch-making discoveries if it fulfils all that Messrs. Calmette and Guèrin claim for it, but sufficient time has not yet elapsed to allow of its value being assessed. To my mind, the real test of the vaccine will be when the female bovine reaches the maternity stage of its life. At the moment the two greatest objections to the vaccine appear to be that it will render the tuberculin test useless and that the young animal must be isolated from the possibility of infection for at least twenty days after inoculation. We all know how difficult it is to ensure the complete isolation of an animal on the average farm. Presumably the tuberculin test difficulty could be overcome by such measures as the tattooing of animals and the issue of veterinary certificates of inoculation, but that is looking rather far ahead. There is no means of immunising cattle against Johne's disease, but if the B.C.G. vaccine proves to be successful it may be worth attempting something on similar lines in Johne's disease, although the lesions are not similar. According to the reports of Major Comerford and other veterinary surgeons, Laidlaw and Dunkin's distemper vaccine appears to be highly successful. Two years have now elapsed since the commencement of these field trials and, as far as I know, no reports of immunity breaking down have been published. It would be interesting to know if immune dogs are susceptible to the secondary organisms. The chief difficulty seems to be the possibility of an animal which is reacting to the second inoculation being infective to others—although those who have used the vaccine say that this is not so—and great care would have to be exercised where all the dogs on any premises are not being immunised at one time. It is to be hoped that when commercial firms produce the vaccine its sale will be limited to veterinary surgeons. None of the vaccines against contagious abortion render the animal immune in the strict sense of the word; they merely induce a state of tolerance or, as some French workers call it in connection with piroplasmosis, "premunity," and do nothing towards reducing the incidence of the disease. In the case of foot-and-mouth disease only partial success has been attained in immunising animals by the use of formalised virus, and such success has been only against the homologous strain, although Vallée reported in 1928 that he had inoculated seven bovines, 8 to 18 months old, with formalised virus and they resisted a test with virulent virus fifty days later. In this disease the plurality of strains adds to the difficulty. Anti-anthrax vaccination gives very good results on the whole, but there has always been a percentage of failures which renders it unsuitable for employment in this country. However, French workers in North Africa have claimed great success lately with intradermal vaccination. Velu reports that during the period 1924-26 more than half a million animals were vaccinated in the various French possessions and it has been found possible to vaccinate without accident even when there is an actual outbreak; in fact, outbreaks can be stopped in forty-eight hours. Immunity generally lasts for about a year. Other French workers in North Africa support this statement. The serum and virus inoculation against swine fever is successful enough when used with care and discrimination, but in this country most of our outbreaks are complicated by the presence of secondary organisms which are apt to upset the results of vaccination. Swine erysipelas is not usually sufficiently epidemic in this country to merit vaccination. It is done on the Continent with successful results on the whole. The work of Gaiger and Dalling has done a great deal towards reducing the incidence of braxy and lamb dysentery in the North. Probably the most destructive disease in poultry in this country is roup. The live vaccine of de Blieck and Heelsbergen is claimed to be very successful, but Doyle, in this country, found it to be unreliable.

Mr. J. R. BARKER: Very much the same criticism can be levelled at Mr. Scott's paper as has been levelled on a previous occasion. That is, that not necessarily are organisms that are found in a wound or on a diseased membrane the causative organisms of the condition which it is sought to overcome. Perhaps some of the good results, or should I say lack of bad results, he has found following the inoculation of living virus can be explained in that way.

I think he mentioned the treatment of fistulous withers with vaccine, and I believe uses an injection of an attenuated culture for this condition. I would ask which organism he found in those cases. I and quite a number of other people, have found the *Bacillus abortus* in the pus from fistulous withers, or an organism which so closely resembles the *Bacillus abortus* that it cannot be distinguished from it, microscopically or serologically. Moreover, these cases will give a local response to the injection of a killed culture of *Bacillus abortus*. Mr. Scott says that he has achieved good results in treating fistulous withers with vaccine, but when he comes to discuss the treatment of abortion in cattle with vaccine he says that no vaccine therapy is of any use. His experiences, if the causal organisms are identical, should coincide.

I fail to see how the introduction of a live vaccine, if that vaccine is composed of a living organism as opposed to a killed culture, can do otherwise than comply with Koch's postulates, by which the agent must be able to reproduce the disease. So that it astonishes me that anyone can be guilty of adding 50 c.c.s of a live virulent culture, without attenuation, into cattle obviously suffering from infection with the *Bacillus abortus*.

I would like Mr. Scott to square the position with regard to fistulous withers, a condition reported to be due to an

organism like the *Bacillus abortus*, with his statement that vaccine is no good for infection with the *Bacillus abortus* of cattle.

There is quite a fresh attack being made in other countries upon the abortion question. We are also beginning to find that we have not had the results we should have had in England from the use of a vaccine composed of dead germs, or the live germs of the Ministry of Agriculture. The theory is being put forward that many cases may be due to a filter passer. Here again I do not think we can compare the results achieved by the use of killed culture or virus where the disease may be due to a filter passer. Some distinction in the ordinary routine method of producing immunity should be made, where the disease producing agency is a gram positive organism, a gram negative organism, a filter passer, a protozoon or a spirochæte. I would like Mr. Scott to make that clear.

Captain T. A. SHAW: What our friend says about abortion rather intrigues me. We (Genatosan, Ltd.) have a dead vaccine, which we are quite sure about: we have had good results, but on several occasions where the results have not been satisfactory we have sent up the material to the Laigle Laboratory to be examined, and we have had the report that the bacillus of Bang was there, but that it was possible that the abortion in these cases was due to some condition present at the same time, *e.g.*, metritis. We are in the position to-day, with contagious abortion, that we are in the dark as to the cause after vaccination. As regards the live vaccine, I myself used it quite a lot when I was in practice, and we had good results with it, especially where we segregated the animals. The greatest trouble was the subsequent occurrence of sterility, which does not occur with dead vaccine.

With regard to Mr. Scott's remarks on interdigital cysts, we have a vaccine for that. It is a stock vaccine and we have had very good results with it. There is no special organism in it excepting the polyvalent organisms—but after three injections you get a clearing up of the condition.

Mr. J. C. COLEMAN: I should like to add my few words of thanks to Mr. Scott for the very instructive paper he has given us, though we are all aware that many of his theories are very controversial. I am not going to attempt to go into the controversial side myself, but I would like to give you a little of my experience in the use of vaccines and bacterins, as I like to call them. [Mr. SCOTT: Speak English. (Laughter.)] The nomenclature of these things is somewhat bewildering to me; I have always looked upon a vaccine as containing live organisms and the bacterin as containing dead ones.

Coming back to the material itself, I have had excellent results from autogenous vaccines, though possibly it is not quite correct to call the material autogenous after the first cultivation. I am alluding to mastitis in this connection, having had a true form of contagious mastitis. I have had the material bacteriologically examined, and I have found the same organisms present in the outbreak. I have used on all the cows the vaccine made, and I have injected it into a large number as a prophylactic, and it has proved successful. I can only remember, during the last twelve months (when I have vaccinated over a thousand cows) two cases in which I have had suppuration of the udder following mastitis, and in both cases they lost only one quarter, the other three remaining all right.

Some reference has been made to the new vaccination against distemper. I am one of those favoured few who had some vaccinations to perform during the experimental stage. The first injection, which consists of 5 c.c., I believe, contained the dead organism; the second, which was intradermally injected, was the live virus. I was present at the Central Division meeting to which Captain Comerford presented his paper, and I was rather struck by the number of gentlemen who had been making use of this who made the observation that these dogs showed temperature and malaise after the virus injection. Out of the few that I did (ten or twelve couple) I only had two that had a rise of temperature, and I took particular notice at the time that in both of these a certain amount of the virus (of which the dose is .25 c.c.) escaped into the subcutaneous tissues. I recited this experience of mine at the meeting, when Captain Comerford referred the point to Major Dunkin to answer. No one else seems to have observed that, and Major Dunkin said that in all probability my suggestion was right—that owing to the rapid absorption of the virus from the subcutaneous tissues in those two cases a rise in temperature took place. Now, unfortunately, they are diluting the virus, which has to be injected subcutaneously, and I am waiting to see the result, as I cannot inject 1 c.c. intradermally, otherwise I should have continued to do so.

Concerning contagious abortion, I have used both the Ministry of Agriculture's products and the double vaccination with the dead bacterin and I am in favour of the second. In the case of the former, a number of people I know treated their animals for contagious abortion without having the blood examined, and thus ran a grave risk of introducing the disease if it were not already in existence in their herds. Another objection I have to the Ministry's vaccines is that at least 11 per cent. of the cows I have injected with them have proved sterile; in fact, they have in some instances been kept as long as two or three years and bulled regularly, yet they have never again been in calf. With the other, I have had good results and only perhaps two per cent. of sterility afterwards.

Mr. W. R. WATSON: I have no first-hand ideas concerning vaccine and serum therapy, but I would like to thank Mr. Scott for his paper, of which I enjoyed every word. In my hands the abortion vaccine—both live and dead—from the Ministry has varied tremendously and there has been a great deal of sterility afterwards. After the use of the live vaccine in twenty-five heifers there were ten or eleven which never came in calf. I had one dead vaccine—a double vaccine, from Burroughs Wellcome—and injected fifty-two cattle with it, after which we had twelve or thirteen sterile cows. As a practitioner, I am at sea in the matter of knowing what to recommend to my clients in the way of adopting measures against contagious abortion.

Concerning fistula, I got Ferris, of Bristol, to make me a lot of vaccines from material taken from actual cases. I used them in every case in enormous doses, but without any good results as far as the progress of the case went. I have adopted another line of treatment, particularly in connection with poll evil. At one time were were able to obtain the Reading bacillus, which seemed to have the ability to digest dead tissue. In my cases of poll evil I have endeavoured to plug the wound with salt pack, to keep out the air, and in those cases in which a very horrible stench develops you get a very good result. I think the Reading bacillus was discovered during the War at the Reading Hospital, where it was noticed that the soldiers whose wounds developed a very offensive smell made good recoveries, whereas the wounds which remained odourless hung on for a long time. By the process of taking a swab from the offensively-smelling, progressive wound, and rubbing it on a wound which was not progressing quickly, the surgeons produced the same horribly-smelling condition in the latter, which then rapidly progressed. The organism, while possessing the power of digesting dead tissue, is innocuous to healthy tissue.

Mr. J. C. S. POWELL: I certainly was very interested in Mr. Scott's paper, and I think such a paper rubs up one's bacteriology very considerably, but there are several things about which I should like to be informed. For example, in abortion we all seem to be at sea, and I should like to know what you really are going to tell the farmer is the best thing to do. These vaccines are brought out, but there is nothing really worked out about them, and I think I am voicing the views of the profession when I say that we are most frightfully at sea about this condition. I think a good deal more co-operative work should be done on it than is being done to-day to clear up many points about which there are so many diverse opinions, especially with regard to sterility. In my hands the live vaccine has certainly proved satisfactory. I know you do not get rid of the disease, but you do get the cows to carry their calves, and the man who says he does not get good results with the live vaccine either has not used it properly, keeping reliable records, or has been most unfortunate in his class of cow—

you cannot expect to get the same results from all cows. Suppose a cow has an infection of the bowel, or is infected with tuberculosis, it is natural that such an animal will give a different reaction to the live vaccine from that given by a good, healthy cow. I think, however, that if the procedure is carefully and scientifically carried out, good results will generally be obtained by the use of the live vaccine. But it requires a large number to prove it; in the meantime, I maintain that the live vaccine is the best thing against abortion that we have got to-day.

Mr. W. WEBSTER: I should like to ask Mr. Coleman if he has followed up his cases of sterility with *post-mortem* examinations, and the essayist whether he can place any definite data before us on the question of sterility following abortion. I have met with different persons in different parts of the country who are very sceptical of the alleged association of general sterility with abortion. Personally, I have no data on the point, although I vaccinate a large number every year.

Captain J. R. HEWER expressed his thanks to the essayist and to the opener of the discussion and proceeded: For a number of years now I have used the Ministry of Agriculture's live vaccine and I must say that it has given me satisfactory results, inasmuch as the same client comes to me year after year and asks me to order large quantities of it. I think that is one of the best guides we can have—that it is giving the farmer satisfaction. We may not be able to follow up these cases ourselves, but if the farmer asks you to supply him year after year, that speaks for itself. One client has told me that he has reduced his abortions from 10 to 20 per cent. to approximately 1 in 1,000, and he is one of the biggest users of it.

The PRESIDENT (Mr. R. W. Hall): I would like to add something on the matter under discussion, which seems to be the chief subject of interest, *viz.*, contagious abortion. I have used the Ministry's abortion vaccine and my results, like those of Mr. Hewer, have been most satisfactory. The last herd on which I used it was a pedigree Polled Angus herd numbering twenty-five, and out of that number only two failed to produce full-time calves, and they were cows that had aborted previously.

So far as contagious abortion is concerned, I think there is a point that veterinary surgeons should emphasise, and that is—knowing the considerable loss which this disease entails upon farmers throughout the kingdom—the great desirability of contagious abortion being made a scheduled disease. Every case, as in the case of other highly-contagious diseases, should be notifiable, so that it can be dealt with in the early stages, instead of the disease being allowed to become rampant in the way that it is to-day.

Mr. A. S. ADAMS: I think it would be impossible for contagious abortion to be included as a scheduled disease. A man may have his animal infected, but he may not know, and he may sell it in entire ignorance of the existence of the disease.

THE REPLY.

Mr. W. SCOTT: I have felt very grateful indeed for the gentle manner in which you have dropped me from the clouds to *terra firma*. (Laughter.) I think your discussion has been a very lenient one; in fact, a little too lenient, because I introduced a good many debateable points on purpose to create an animated and, if possible, an antagonistic, discussion.

The only antagonist I have to deal with really is my friend Mr. Barker, but it is rather hot to-day to start a pugilistic way of setting about our differences, so I shall content myself with replying briefly to him, as to the others. Captain Atkinson is under the impression that vaccines have not come up to the standard which has been anticipated, but I think that question (which is really a very involved one) may be answered legitimately by saying that the vaccine may be at fault and the immuniser may be at fault. Unless one is in a position to embody all the bacteria that are causing the trouble the vaccine will not possess the antigenetic value that it otherwise would. Captain Atkinson raised the point about sera and commercial vaccines becoming attenuated as the result of *keeping*. In answer to that, I would say that no-one who knows anything about these biological products would think for one moment of using a serum or a vaccine which had undergone deterioration as the result of age, for that would place the treatment at a considerable disadvantage and would bring vaccine and serum therapy into disfavour through the absence of good results. Further, that is another reason why I prefer autogenous to stock vaccines. Captain Atkinson also raised a point in connection with the immunity to anthrax of Algerian sheep, and he read a very convincing observation from a French journal contradicting the statement of the natural immunity said to be possessed by these animals to that disease. But the classical observation that Algerian sheep are so immune has been made for many years. Personally, I cannot confirm or refute it; it is only what I have read and heard of this matter, but when all is said and done it is a very small point, for I merely raised it in connection with *natural* immunity and gave it as an illustration. He goes into the question of abscess formation at the seat of inoculation—in our animals we do not bother much about a local abscess, which is indeed a small matter.

As regards anaphylaxis, I can only reiterate what I have already said, that I have never come across a case of anaphylaxis consequent upon serum or vaccine administration, but I must say this—that serum, if it comes from an animal of a different species from the subject to be inoculated (*i.e.*, the serum produced from a horse and that horse serum injected into a cow) has a tendency to produce anaphylactic shock. That is the difficulty when the human being has to receive serum injections, for sera for prophylactic and curative use in the human being must be derived from the animal species. Captain Atkinson has enlarged upon the subject matter of the paper, for which I was rather sorry, because I would have liked him to have concentrated his brilliant observations upon the subjects introduced in the context of the paper. The other points he raised, I feel, do not, therefore, enter into this discussion.

Mr. Barker does not agree with me that injecting pathogenic organisms into an animal that is already charged with these pathogenic organisms is a logical procedure. As I said at the beginning of my paper, even the ancient Hippocrates agreed that that was a sound doctrine to adopt.

This view of Mr. Barker, unfortunately, is a common, but an erroneous one, and if I may say so, based on ignorance of the subject. Of course there are pitfalls in every brand of medicine. Some of these I endeavoured to safeguard you against in the context. Further, the fact of injecting an antigen *sub cutis* does not mean that the system will be flooded with poisons. Its primary action is *local*, its ultimate *local* and it is this action and reaction that stimulate the cellular and humeral bacteriotropic powers and activate recovery.

We must never overlook the fact that vaccine therapy stands first and foremost of all the therapies in bacterial invasions, for it is the nearest approach to nature's therapy we possess.

Mr. Barker took me to task in connection with the prophylactic value of vaccines in abortion, and drew as an analogy the curative value of vaccines in fistulous withers. Personally, I cannot see the logical connection here; one is a specific condition due to a systemic contamination and affecting the blood stream, and in which the *Bacillus abortus* is not only found in the uterus and fœtus but in the milk, and the other is a circumscribed, localised condition, without any systemic contamination or connection, and I may say that not once have I found, in all the cases of fistulous withers examined, an organism resembling the *Bacillus abortus*, and I would have been very surprised had I done so, so that it is news to me that the *Bacillus abortus* does exist in these cases of fistulous withers and poll evil. Further, I seriously question if the pathogenic organism of Bang, peculiar as it is to the bovine species, would live and reproduce itself in the horse's tissue, because there again we have a relationship which is a very definite and specific one; invariably each species of animal is a host of its own particular organisms, and I question whether the *B. abortus Bang* could live, and if it could live

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could produce pathological lesions in the horse. Mr. Barker introduced a very hypothetical point in connection with a filter passer being a *causa causans* of abortion. Who has proved that ? The whole of that observation seems to me to beg the question. That may be what we are up against in many of these cases of the etiology of which we know little or nothing at the present time, but to say that contagious abortion is due to a filter passer is an heroic observation to make.

Captain Shaw introduced the question of interdigital cysts and he says that he gets good results from a stock vaccine. So far as I am concerned, I put greatest reliance in autogenous vaccines, because in so doing one is utilising the organisms that produce the disease specifically. Captain Shaw also made what is to me an ambiguous observation, when he talked about a polyvalent serum organism : that may be a new kind of organism, but I cannot say that I have ever met with it. He further states the usual causative organism in interdigital cysts is the *Bac. pyocyaneus*. Well, gentlemen, in all my experience I have never met that organism in those cases and I question if anyone else has ever seen blue or green pus coming from these cysts.

Proceeding, Mr. Scott said : Mr. Coleman is very fond of the term 'bacterins,' but we in England generally have a preference for our vernacular, and 'vaccine' is quite good enough. As a rule, one understands that when one is dealing with a vaccine, it is a sterile culture of a particular organism or organisms suspended in normal saline solution to which a preservative, carbolic acid or Trikresol, has been added. A *virus* is the suspension of a living, active organism.

Mr. Watson considers that the *B. abortus Bang* live culture vaccine has a tendency to produce sterility. (Mr. WATSON : I said " both live and dead.") I would like to have that point cleared up. Would Mr. Watson inform me whether he considers sterility in his cases was due to the vaccine or to the pre-presence in the animal of the abortus Bang bacillus ? (Mr. WATSON : The live vaccine —out of twenty-five heifers there were ten or eleven which never came in calf at all.) Therefore, you could not prove that these animals were already " carriers " of the bacillus of abortion before you inoculated ? (No.) It has been proved that in some diseases an animal may be a " carrier " of an organism, and be capable of transmitting the infection, and yet itself exhibit no clinical symptoms.

I am glad mention was made of the Reading bacillus. I quite agree that it is in local conditions such as wounds that it may be most usefully employed, and that its therapeutic value consists in its power to digest diseased tissues. By reason of that property it eliminates the organisms producing the diseased condition, but you can get the same result by the use of the curette. Another interesting point raised is the employment in fistulous withers and poll evil of salt plugs—a method I have advocated for many years. Its efficacy was definitely proved during the War, and Sir Almroth Wright did a great deal of work in regard to saline solution and the dressing of septic wounds. The whole *modus operandi* in connection with salt is its great osmotic power, in drawing the hyper-immune serum through the tissues, and facilitating the leucocytic egress which devours the infective bacteria, facilitating a positive chemotaxis. Mr. Powell's observations were rather contradictory, and I fear involved—I cannot quite tell whether he is in sympathy with vaccine treatment or not. (Mr. POWELL : Yes.) The subject of sterility (introduced by Mr. Webster and others) is somewhat beyond the scope of my paper, but undoubtedly we have in abortion a very important cause in connection with sterility—not sterility due to organic disease of the generative organs, but to a specific condition, where you get apparently perfectly healthy animals turning to the bull, and a large number of them. Mr. Hewer seems to be in a very happy position in regard to abortion. He says that the Ministry of Agriculture vaccine has given him security to the extent of a reduction in the abortions to 1 in 1,000. That is one of the most startling results of which I have ever heard.

Mr. Hall raises the question of scheduling contagious abortion, but I am in agreement with Mr. Adams with regard to that. It seems to me a very big question, and if my memory serves me right, some years ago the point was mooted by some of the agricultural associations—that the Board of Agriculture should be urged to schedule abortion, but it was turned down as being an almost impossible proposition financially. There is, however, one Act on the Statute Book which prevents a farmer from exposing an animal, which he had reason to think has aborted, in the open market. I have never seen a prosecution based on that, however, and I question whether it is not a dead letter. It is unfortunate if it is so, because I know, and you know, that many a man has a cow which slips her calf and, wanting to sell her, the first thing he does is to put a bastard calf with her and sell her in the open market. That is the origin, very often, of a fresh outbreak of contagious abortion on a clean farm.

Successful R.C.V.S. Prosecution.

A Hessle man who, it was stated, had held himself out to be a horse, cattle and dog doctor, but who was not qualified, appeared before the East Riding magistrates on 22nd May, summoned under the Veterinary Surgeons' Act, 1881, for not being a Fellow or Member of the Royal College of Veterinary Surgeons and using a name or title stating or implying that he was a Fellow or Member of the College.

The defendant was William Herbert Crocker, Prestongate, Hessle, who it was stated, had displayed cards in shops in Hessle, holding out that he was a horse, cattle and dog doctor.

A fine of £4 4s. including costs was imposed. Defendant undertook to withdraw the cards from the shops.

Mr. A. W. Stephenson prosecuted on behalf of the Royal College of Veterinary Surgeons and Mr. Basil K. Barton defended.

Mr. Stephenson pointed out that defendant was in no way qualified as a veterinary surgeon. On February 7th, cards were found displayed in certain shops in Hessle containing the words " Ex-Veterinary Sergeant Crocker, horse, cattle, and dog doctor, Church Cottages, Prestongate, Hessle. Dogs and cats boarded for any period, taken out twice daily. Urgent cases attended to at once. Advice free. Moderate terms."

Mr. Stephenson added that smaller cards, of a similar nature to those displayed in the shops, were also discovered.

Evidence as to the cards being found displayed was given by P.C. Leighton and other witnesses.

Defendant described the training he had received while a member of the Royal Army Veterinary Corps and said that whilst he was at Rouen in 1916 he became fully qualified as a veterinary sergeant. He had had cards in the windows at Hessle for four years and he had never received any complaints from the College or the public. The police had sent dogs down to him for destruction.

Mr. Barton pointed out that if the defendant had put the word " surgery " on the card, or if he had said there was a home where they could put their dogs, no offence would, according to law, have been committed.

It was further stated that the offence related to the person, not the place.

The Chairman, in intimating the fine to the defendant, said that the defendant had not acted with evil intent. It was a misunderstanding on his part. He was not entitled, however, to issue such a card as that.

Pedigree Sheep in New Zealand.—In New Zealand there are no fewer than 161,673 registered Romney Marsh sheep, while 3,513,811 head of the same breed are not in the Flock Book. There are 63,319 registered South Downs, and 106,597 unregistered ; 9,269 registered Lincolns and 96,186 unregistered ; 21,226 registered Leicesters, and 83,279 not registered ; 4,453 registered Shropshires, and 14,596 unregistered ; and 4,752 Ryelands are registered and 14,069 unregistered.

The Veterinary Record.

1st June, 1929.

THE THANKSGIVING FUND.

In consequence of its receipt practically at the time of going to press, we were unable to give in our last week's issue that prominence to the announcement of the promotion of a Veterinary Thanksgiving Fund, which both the motive and the importance of the event merited. We trust that the reproduction in this column of the whole reference to this matter which then appeared, and the publication of which was pressed forward to synchronize with the despatch of individual appeals, will serve its dual purpose of attracting the attention of all our readers to the Fund, and of emphasing our desire that the response to the appeal should be worthy of the circumstances which inspired it.

"The following circular has been issued to the profession this week by the Secretaries of the two Veterinary Benevolent Funds. We can think of no better occasion for an expression of the loyalty of the profession than the present, when His Majesty the King has returned home fully recovered after a long and tedious illness, nor of a better means of expressing that loyalty than the one proposed. We hope the appeal will receive the hearty and generous support of the profession":—

"'We have the greatest possible pleasure in announcing that a generous member of the Veterinary Profession, who for the present desires to remain anonymous, has offered the sum of £100 to be applied to benevolent purposes within the profession, if an additional sum of £100 is subscribed before June 30th next.

"'This kind offer has been gladly accepted and with the approval of the donor it has been decided to open a VETERINARY THANKSGIVING FUND, to celebrate the return to health of our Gracious Majesty the King after his long and very serious illness.

"'We feel that we can confidently count upon the support of all members of the profession in raising such a fund, for we are certain that there can be no more fitting method, or one that would appeal more to His Majesty himself, than a fund to help those who cannot help themselves. There is reason to believe moreover that should a larger sum than the £100 be realised, our anonymous donor would be desirous of further increasing his contribution; but we also hope that some other member may be found to emulate his excellent example.

"'Subscriptions to any amount may be sent to either of the undersigned, and we shall be glad to publish an audited statement when the fund is closed.

"'We are,

Yours sincerely,

J. W. BRITTLEBANK,

FRED BULLOCK.'

"Addresses to which subscriptions may be sent:—

Lt.-Col. J. W. Brittlebank, C.M.G., M.R.C.V.S., D.V.S.M. (Vict.), President of the Victoria Veterinary Benevolent Fund, Hon. Secretary of the National Veterinary Benevolent and Mutual Defence Society, Guildhall Chambers, 38 & 40 Lloyd Street, Manchester.

Fred Bullock, LL.D., F.C.I.S., Secretary of the Victoria Veterinary Benevolent Fund, 10 Red Lion Square, London, W.C.1."

Some Thoughts on the Horse in Relation to Modern Transport Problems.*

By SIR W. H. D. ACLAND, BART, DIRECTOR OF MESSRS. W. H. SMITH AND SON, LTD.

The business of Messrs. W. H. Smith and Son has been in existence for over a hundred years, and its principal, though by no means only, work is the distribution of newspapers. This is a somewhat peculiar business, because news is a most perishable article. There is also but very little margin of profit in the handling of newspapers. Therefore, speed and economy have to be studied with even greater care than that necessary in most businesses. Transport thus becomes an unusually urgent and important matter, and Messrs. W. H. Smith and Son have therefore naturally had occasion to study it and the various possibilities arising out of different forms of transport, by sea, by land and by air during such time as the various methods have been available.

There is one important conclusion that is obvious when the problem is studied, but is not so obvious at the first glance, to judge from the correspondence one has read on the subject, and that is that every particular transport problem is best solved and treated on its own. For instance, no one would use a camel in London or a horse in the Sahara. That is easy, but it is not so clear why the public may see a W.H.S. motor van and a W.H.S. horse-drawn vehicle in the same street at the same time and apparently carrying the same sort of parcels. The answer to the apparent puzzle is that the journeys are different, or that the need for speed is greater than the need for economy in the one case and *vice versa*. *My Firm's records show that it is definitely cheaper to use a horse when a horse can do the work than it is to use a motor van.* The problem, then, to be solved in most instances is whether the horse can do the particular work under discussion, and do it properly. The general answer is that we have had about 100 horses in London alone for a great number of years. Our motor traffic has increased, but it has increased beyond the comparatively short radius for which horses are primarily more suitable. In the old days horses used to travel 20 to 30 miles per day. Nowadays, on straightaway runs it is better to use a car. On the other hand, for short runs, particularly where there are many stops and where the normal traffic of the roads is such as to prevent a car developing anything like its maximum speed, a horse is to be preferred. In the narrow turnings and courtyards, such as abound in the city and in those parts of London where newspaper and book publishers' presses are busy during most of the 24 hours, there is a tremendous advantage, often unrealised by the general public, that a horse drawn van with its full load can turn round much more quickly and with far less disturbance to its neighbours than a motor van with its far larger turning circle.

Under the system of stable management evolved by Messrs. W. H. Smith and Son the same van is often out with different drivers and different horses for 18 to 20 hours out of the 24. This adds a great deal to the economy both of running and of storage of vehicles, and is not a custom practised in any motor fleet at present, although a change of engine as well as pilot is often made in aeroplane services. All forms of transport are liable to break-down or accident, therefore the wise manager will always have spare vehicles available. These spare vehicles are very often never used for days at a time; nevertheless, they cost a good deal, if only owing to overhead charges, such as interest on capital, licences, insurance and depreciation, rent and so on. Owing to the higher initial cost of a motor car compared with a horse and van, and the fact that, wonderful as the human mind is, man has not been able to manufacture machinery equal in reliability to that produced by nature, the cost of spare vehicles is less in the case of the horse-drawn traffic than mechanically propelled

Document No. 21 of the National Horse Association of Great Britain.

vehicles. The other expenses connected with the running of vehicles, whether horse drawn or motor drawn, depend a good deal on the mileage done. If, owing to loading and unloading delays which are often beyond the control of the driver or his manager, it is impossible to arrange for a sufficiently high mileage, then the cost of a car per mile becomes prohibitive compared with the horse.

It has been our experience that no car yet submitted to us can compete on a question of cost with a horse vehicle doing about 20 miles per day. Equally, of course, no horse could possibly compete with a motor vehicle doing 50 miles per day or more.

These last few sentences have assumed that the load is approximately that for which the vehicle was intended, but if the load to be carried at any particular moment is either greater or less, the horse scores rather heavily. For a small distance a horse can pull a load greatly in excess of the normal load without detriment. A motor cannot. For very light rounds the horse does not get so tired, and therefore can do rather more mileage than normal. On the other hand, the saving in petrol cost under same conditions in a car is a very small thing in practice, whatever various engineers may think about it. Again, it is true that if there is no work the horse has to be fed, and the motor does not. This is favourable to the motor, but the losses incurred owing to the overhead expenses mentioned previously, particularly depreciation, interest, licences and insurance are higher in the case of a mechanical vehicle.

The whole matter of horse *versus* motor can be summarised thus. There can be no question as to which is better, because both are better, each in its own respective sphere, regardless of cost. For short distances, particularly in traffic or for use in narrow streets and awkward yards and where there are frequent stops, the horse is supreme, and is also cheaper. Horses are economical for the work done, when properly used; also, they are more handy and more reliable. For longer distances and on occasions where speed is both possible and necessary the motor is the best, but is the more expensive. In between the two zones there is, as in most problems of life, a borderland, where each individual little problem will have to be examined by itself, and where probably it will be found that a horse will do at least as well as the motor and probably do it more cheaply.

There are one or two other aspects of the problem that are perhaps worth mentioning, not so much from the point of view of the employer as of the public. From a national point of view horses will probably be required for commercial, private and army services, and therefore the breeders and farmers of Britain should be encouraged to produce the best class of animal, and individuals and firms buying horses should have the satisfaction of knowing that they are supporting an old-established and important section of the agricultural community whose business is none too flourishing at the moment. The same remarks apply, of course, to such useful members of society as the veterinary surgeon, harness maker and the van builder, and, of course, the British farmer who supplies the necessary fuel for the horse, and who, in our opinion, deserves at least as much encouragement as the oil companies who produce the fuel for the motor-van.

Another aspect of the problem is the fact that the pedestrian still retains the knack of avoiding being run down by a horse, while he has not yet learned to avoid the motor. We believe that street casualties statistics confirm this view, but do not say whether the comparative immunity from horse accidents is due, as it quite well may be, to the instinct of the horse in addition to its driver, or whether it is that the speed of a horse is easier to judge than the speed of an oncoming car.

As regards advertisement, a motor van may be made very striking, but we cannot help thinking that a smart and well turned out horse and vehicle are more attractive to the public than any other form of road transport, and are in themselves a fine and inspiring sight, which really affords something of a thrill to a nation of horse lovers like ourselves.

The Weinberg Casting Pen.

The Leeds correspondent of the *Jewish Chronicle* contributes the following to the issue of his paper dated 5th April, 1929:—

The Weinberg Pen was again tested in Leeds last week. In January, 1928, at a test at Islington, the Committee found that certain alterations were necessary, and the majority of the Committee agreed that a further test of the improved Pen should be held in a private slaughterhouse in Leeds. The London *Shechita* Board having intimated that it would not take cognisance of a trial held otherwise than under its own auspices at Islington, the expenses of the present trial were borne by the R.S.P.C.A. It is understood that a test of the apparatus is to be made next month in London under the auspices of the *Shechita* Board. There were present at the demonstration last week:—

Prof. F. T. G. Hobday (Principal of the Royal Veterinary College), Chairman; Capt. C. W. Hume, M.C. (University of London Animal Welfare Society), Hon. Secretary; Prof. C. Lovatt Evans (Physiologist, University College), Mr. A. Gofton (Chief Veterinary Officer, Edinburgh), Major J. A. Dixon (Chief Veterinary Officer, Leeds), Major W. J. De Vine (Chief Veterinary Officer, Birmingham), Capt. H. L. Torrance (Chief Veterinary Officer, Birkenhead), Capt. W. K. Johnstone (Veterinary Officer, Manchester), Dr. J. J. Jervis (Medical Officer of Health, Leeds), Miss Violet Wood (Secretary, Council of Justice for Animals and Humane Slaughter Association), Mr. R. O. P. Paddison (Hon. Advisor for Humane Slaughter, R.S.P.C.A.). There were also present the Rev. E. M. Levy, M.A., Mr. S. Landman, M.A., and Mr. Harris Weinberg, the Inventor.

Six bullocks were operated upon. The Revs. H. R. Goldwater (Leeds *Shechita* Board) and Mr. Nemeth (Leeds Jewish Workers' Burial Society) performed *Shechita*. Mr. Weinberg was permitted to cast the first animal. He was then requested to retire, and Mr. Lumley and a slaughterman operated the Pen on the other five animals. Stop watches were used for time recording. After the demonstration, a meeting was held at the Town Hall, when Professor Hobday communicated the following unanimous findings of the Committee: (1) That the defects in the machine, witnessed at the previous demonstration had been corrected; (2) that the Weinberg Pen is a distinct humane improvement on the present method of casting for the purposes of Jewish slaughtering; (3) that the average time occupied by the casting of the six animals demonstrated that day was 9½ seconds; (4) that the question of an automatic brake for the machine to hold the Pen ready with the animal in it, should be investigated.

Another Slaughtering Device.

A new device for slaughtering animals for Jewish consumption was demonstrated at the Liverpool Corporation abattoirs.

The device—a metal "head saddle"—was invented by Mr. E. V. Davies, butcher, Albany Road, Kensington, Liverpool.

When the beast has been "cast" on its back, the usual procedure is for the head to be held in position by hand while the *Shochet* cuts the throat. By Mr. Davies's apparatus, which several Corporation officials saw in use, a 15 cwt. bullock had been thrown and it was only a matter of seconds before Mr. Davies, single-handed, had adjusted the saddle—an iron frame attached to a long handle round its head—and the *Shochet* had operated.

The apparatus works on the leverage principle, and there was no difficulty whatever in keeping the bullock's head rigid. The animal did not flounder in the least.

We understand that a demonstration of this apparatus is shortly to be made in London.

Do a Thickened Cord and Swollen Scrotum some weeks after Castration, if temporary, constitute cause for Rejection as Unsound?

Sheriff J. A. T. Robertson, Linlithgow, has issued his interlocutor in an action raised by Hugh Andrew, farmer, Lennoxlove, Haddington, against Robert Smillie, Rashierigg, Fauldhouse.

The Sheriff-Substitute, having considered the cause, finds: 1, That on 10th October, 1928 pursuer exposed for sale at Messrs. Lawrie Symington's Auction Mart at Lanark a yearling gelding, warranted free from vice, and sound. The Defender purchased the said gelding at £25; and immediately after had the gelding examined by a veterinary surgeon who granted him a certificate that the animal was not sound, being swollen on the off fore-tendon and scrotum. Defender intimated his rejection of the gelding on the ground that it was not conform to warranty, but pursuer refused to accept rejection.

The Sheriff-Substitute finds in law that the Defender was entitled to reject the said gelding; ; that the Pursuer is not entitled to demand payment of the price. He assoilzies the Defender and finds the Pursuer liable to the Defender in expenses.

Points from the Interlocutor in regard to the veterinary evidence given in the case are quoted as follows:—

The chief witness for the Defender is the witness Peter Meikle, Veterinary Surgeon, Strathaven. On making an examination of the gelding, Meikle swears that he found that the tendon at the back of the off foreleg was swollen and also that the scrotum and spermatic cord were swollen on the near side. Having ascertained from the Defender that he was the purchaser of the animal and that he has bought it with a full warranty, he granted the Certificate No. 7 of Process, that the animal was unsound. I have no hesitation in believing that he found on the animal the symptoms that he described: I do not accept the suggestion that, having found out that the Defender was disappointed with his bargain when he saw that the gelding was "lady-toed" and ungainly in action, he invented the defects which he set down in his Certificate of Unsoundness.

On the other side the chief witness is Mr. W. F. Houston, a Veterinary Surgeon practising in Paisley. Mr. Houston, who also was present in Lawrie Symington's Mart on 10th October, had, he says, twice that day examined the gelding on behalf of prospective purchasers, and having found nothing wrong with it, advised them that it was sound. After he learned that the gelding had been rejected by the Defender, as disconform to warranty, he was asked by the Pursuer again to examine it. When he did so, he was aware of the terms of Mr. Meikle's Certificate, and he says that the off fore leg was not swollen in the tendon, nor was the scrotum or spermatic cord on the near side. He says that the only thing he found was a sign that a dried scab had been recently knocked off a healed wound. Mr. Houston, however, on two occasions, once on examination-in-chief and once under cross-examination made a remark that suggested to my mind that he had found some appearance that was not quite normal, though in his opinion not enough to create unsoundness. In answer to Mr. McHardy (Proof p. 84, E-F) he said: "Practically it was sound": and again, in answer to Mr. Scott he said (Proof p. 94 C): "For practical purposes I passed him sound." Later he said that he was wrong in making use of that expression. I do not personally think that the expression "practically sound" would be used by a veterinary surgeon in speaking of an animal examined by him, unless there were symptoms observed, which had been, or might be taken to be, indications of unsoundness.

There is another passage in his evidence which reflects upon its reliability. He was asked by Mr. Scott (p. 95 D): *Q.* "Was it perfectly evident to you that this horse had been recently castrated?" He answered: "Yes, I knew." As the answer did not seem to me quite to meet the question, I said to him: "Suppose you had known nothing about this horse at all, would your examination of it that day have satisfied you that it had been recently castrated?" He answered: "No, I don't think it would." Mr. Scott then asked: "Did you use these words to my friend that any person would see that he had been castrated a few weeks ago?" and he answered: "Yes, if they examined him thoroughly."

From this it may be inferred that Mr. Houston either contradicted himself or that his examination on 10th October was not "thorough." But perhaps the real explanation is that, owing to the fact that he is no longer young and has just recovered from a long illness, he is speaking of matters of which he has not a perfect recollection.

Milk for Growing Chickens.

(*The Scotsman*, 26-4-29).

Milk in some form is generally recognised as one of the best supplementary foods for growing chickens, but poultrykeepers are sometimes uncertain as to the amount which it is advisable to give. An experiment which is being carried out by the Edinburgh and East of Scotland College of Agriculture and the Royal (Dick) Veterinary College at the Poultry Department, Liberton, is giving some interesting results regarding the effect of milk on the growth of chickens in the early stages. Eighty-eight sex-linked pullets, hatched January 14th, were divided into four groups of twenty-two birds each. Group 1 received a mixture consisting of equal parts of millet, dari, canary seed, hemp, broken lentils, broken peas, broken rice, groats, ground maize and linseed wheat. Fresh separated milk was always before the birds. Group 2 received the same mixture, water being given instead of milk. Group 3 received a mixture of equal parts of groats, ground maize and bruised wheat only, with separated milk to drink. Group 4 received the same mixture with water. A weighed amount of the mixtures was placed daily in boxes before the chicks. Each day's residue was weighed, and the amount eaten calculated. The four groups of birds were weighed every five days. Fine oyster shell was supplied in boxes, and green stuff was given when available. From the beginning of the trial, and throughout the first period of fifty-six days, it was found that the milk pens were not only putting on more weight than the water pens, but they were consuming considerably more food. At some stages the average weight of the milk pens was as much as four times that of the water pens, while the average amount of food consumed was double.

Average Gain in Weight.

The following table shows the total average gain in weight, and the total average amount of food consumed during the first period:—

	Group I. (Milk) Grms.	Group II. (Water) Grms.	Group III. (Milk) Grms.	Group IV. (Water) Grms.
Aver. initial weight per bird ...	36.2	36.3	36.0	36.6
Aver. final weight ...	508.0	147.7	474.1	200.5
Aver. gain ...	471.8	128.4	438.1	163.9
Aver. amount of food eaten per bird ...	1280.5	667.8	1218.3	764.8

At the end of the first period the four groups were put on the same mixture, such as is given to all the other chickens on the station at this age. Milk and water are being given as before, and the chickens weighed every ten days. The total average gain from the beginning of the experiment up to the ninety-fourth day is as follows:—

Group I.	Group II.	Group III.	Group IV.
Grms.	Grms.	Grms.	Grms.
1175.6	542.0	1141.7	557.4

It is intended to carry on the experiment into the laying period, when the birds will be trapnested for twelve months, and their eggs recorded and weighed, with the object of finding out whether the results justify the entire replacement of water by separated milk to drink.

The London Cart Horse Parade Society.

The Thirty-ninth parade of this popular metropolitan competition was held on Whit Monday in Regent's Park, and the number of entries and the quality of the turns-out showed that there is no diminution of the interest taken in London's commercial heavy horses, in spite of the greater use of motor transportation. The increased number exhibited this year over previous years, too, is a clear indication that the heavy horse is gaining favour in industrial activity, and that it is becoming more and more realised that he carries economic advantage over his mechanical rival. For instance, in the year 1926—which marks the lowest ebb in the production and use of British breeds of heavy horses—519 horses with 449 drivers were entered; in 1927, there were 801 horse entries, with 712 drivers; in 1928, 814 and 723 respectively, and this year there were 834 horses and 739 drivers competing. In quality there were many magnificent specimens of their particular breeds, from the smaller, compact, useful draught horse to the 17.3 and 18 hands Shire weighing up to 22 cwt.

The objects of the Parade Society are to improve the general condition and treatment of London cart horses, to encourage drivers to take a humane interest in the animals under their care, to encourage the use of powerful cart horses suitable for heavy work in the London streets. Prize money is furnished solely from subscriptions and is given to those drivers whose horses reflect exceptionally good treatment, careful grooming, well-kept and properly-fitting harness. The bestowal of a red rosette carries with it a cash premium of 12/– for singles, 20/– for pairs, 30/– for teams of three, and 45/– for teams of four; a blue rosette carries with it 6/–, 10/–, 15/– and 30/– respectively, and a white rosette, 4/6, 5/–, 7/6 and 7/6. In addition, each recipient of a red rosette receives a brass merit badge from the R.S.P.C.A. to affix to his harness. The numbers of awards were as follows:—Red—600 singles, 60 pairs, 12 teams; Blue—48 singles; White—2 and 24 novice prizes at 10/– each. The total of money allotted in prizes and long service premiums amounted to £514 7s.

Service and good character premiums were given to drivers who have been not less than twenty-five years in the continuous service of the same firm. Under this heading a premium of £3 10s.—the Isabel Constable Prize—was given to a driver (James Pitt) who had been 60 years in the employ of Pickfords and Hay's Wharf Cartage Co., Ltd.; two premiums of 30/– each were given to drivers with 51 years and 49 years respectively; eight premiums of 20/– each were given to drivers from 39 years to 46 years' service, twenty-one premiums of 10/– each to drivers of 31 years' to 38 years' service, and thirty-three premiums of 5/– each to drivers of between 25 years' and 30 years' service. The Shire Horse Society, too, annually awards silver medals and premiums amounting to £50 for the best specimens of single horses, pairs and teams, irrespective of breed, and this year 26 silver medals were awarded. Horses of the Suffolk breed also receive premiums granted by that Society and 11 awards at 20/– each were made. Altogether, since the inception of the Parade, 26,884 horses have been inspected by the Honorary Veterinary Committee and have been dealt with by the judges, and cash premiums amounting to £12,995 have been bestowed, in addition to silver medals, diplomas and brasses. A pleasing feature is the interest taken in the parade by Borough Councils, 66 horses of various Councils taking part this year. The prizes and badges were given away by H.R.H. Princess Marie Louise and Sir Walter Gilbey, the President of the Society, in thanking her for so kindly lending her support to the movement, also thanked all those kindly-disposed sympathizers who, by their subscriptions, their inspection and their judging of the turns-out, made the success of the parade possible. The Honorary Veterinary Inspectors were Mr. J. W. McIntosh, Mr. Henry Gray, Mr. W. J. Hatton and Mr. Stanley Broad. Working in five groups, the judges for grooming and harness were Mr. C. G. Argles, Lieut.-General Sir Edward Bethune, Mr. F. A. Claude, Mr. G. Gotheridge, Colonel Jarvis, Colonel Percy Laurie, Mr. F. J. Rawle, Mr. H. Tilling, Major M. Tomlin and Mr. O. Mocatta. Messrs. J. M. Belcher, W. B. Bingham, J. G. Ewart and B. H. Keene judged for the Shire Horse Prizes and Mr. W. G. Munnings for Suffolk Horses. The arrangements for the parade were in the hands of Mr. R. F. Ling, the Secretary of the Society, and great credit is due to him and to the Metropolitan Police and Inspectors of the R.S.P.C.A. for the marshalling of all competitors and the parade generally.

CLINICAL AND CASE REPORTS.

A Clinical Note on the Passing of the Stomach Tube.

By J. F. L. Taylor, M.R.C.V.S. (Lieut. R.A.V.C.), Punjab.

While experimenting with the amount of air that can be introduced into a horse's stomach without causing any untoward effects, the writer has noticed that an additional safeguard to ensure that the stomach, or œsophageal, tube is really in the œsophagus may be arrived at by the under described method.

Pass the tube up the nares into the œsophagus with the usual precautions.

When 36in. (approximately) has been introduced, blow into the free end of the tube by means of the mouth of the operator or an assistant.

If the tube is in the œsophagus, a certain amount of resistance will be encountered, and when this has been overcome, waves or ripples caused by the deglutition of the introduced air will be seen passing down the jugular furrow from the position of the end of the tube, on the near side of the neck over the position of the œsophagus.

What is seen gives an appearance as if the animal was eating food or drinking water very quickly, and the dilations of the œsophagus caused by the passing of food or water were following each other with only very short intervals between each bolus of food or swallow of water.

When the tube by mistake (or on purpose) has been passed through the larynx into the trachea, and air is introduced as above, no resistance will be encountered; the effect being rather like blowing air by mouth through the valve-stem of an empty cycle or motor car pneumatic tube.

No waves or ripples over the œsophagus will be seen in the latter case.

Heat as a Therapeutic Agent in the Treatment of Demodectic Mange.*

By Joseph W. Vansant, Fox Chase, Pa.

About the middle of December, 1928, my wife drew my attention to our little five-months-old Boston pup. She had a skin eruption over the left eye about the size of a small hazel-nut. Just as many do when anything is wrong with their own animals, I made a very superficial examination of the affected part and told my wife to use iodex, rubbed in well, once or twice daily. On December 28th,

*Journal of the American Veterinary Medical Association, April, 1929, New Series, Vol. 27, No. 5.

I was reminded that the trouble was spreading quite a little and that the hair was coming off. Upon examining specimens under the microscope, we found a number of *Demodex folliculorum*.

This puppy is a great, great granddaughter of a Boston we lost of senility last year and the only blood line of our old dog that we have left. We thought so much of the old dog and this pup seems to have so many of her ways, that in this case I was not going to lose a mere client but my happy home, if I did not cure her. As I thought over the case, it did seem that a man who had spent years in college and had over twenty-five years of experience in practice, ought to be able to combat these little parasites just beneath the outer layers of the skin. I had used, on a skin infection of my feet, that had caused intense itching, a solution of resorcin and salycilic acid, one dram of each in one ounce of alcohol.

This gave me almost instant relief, so I gave my wife a bottle of the mixture and told her to use it on the pup twice a day. Some time before that I had talked with Dr. M. J. Harkins, of the School of Graduate Medicine, University of Pennsylvania, about Demodex, and he said that heat had been found quite effective in killing this parasite. I had tried using a tub of hot water on another case but this did not seem to work out, especially where the infection is around the head.

We have a Thermolite (James and Co.) in the house so we thought we would try it. This was used twice a day, from five to ten minutes, on the affected part. It was not objected to by the dog unless it became too hot. Then it was thrown off for just a second and then back again.

This treatment was started about January 1st, 1929. A few days later another small spot appeared over the right eye. Demodex was found and the same treatment applied. We looked for and found parasites every couple of days until the seventh or eighth day. Then I found what appeared to be broken-down or partly decomposed parasites, but have not found any since.

About January 9th, a part setter was brought to my office with a sore spot on the top of her head. On examination we found Demodex. As we were still using the Thermolite on our own pup, I gave this client a bottle of the mixture before mentioned. On January 12th, we stopped using the light and loaned it to the owner of the setter. This was used twice daily, just as we had used it, and on January 23rd, several examinations were made, but not a single parasite was found and the wound looked very well.

The hair is nearly grown out on the little Boston's face at this time. The spot over the right eye is entirely covered over and I have no fear of a return of the disease.

I believe that the main part of the treatment is the heat, as near as I can tell. The temperature reached 120 to 130 degrees Fahrenheit. It certainly would seem that this treatment would be 100 per cent. efficient in those cases which are caught when the disease is just starting, or even in bad cases if it would be possible to take the time to treat all affected parts. We may even fix up an electric heat-bath, such as is often given the human.

(Since this report was prepared, Dr. Vansant has treated another case with equally satisfactory results.—EDITOR, *Jl. A.V.M.A.*)

COLONIAL REPORT.

(**Southern Rhodesia: Report of the Chief Veterinary Surgeon for the year 1928.** pp. 6. Published by Government Printer, Salisbury, Rhodesia.)

The report is submitted by J. M. Sinclair, Chief Veterinary Surgeon at Salisbury, Rhodesia, on 14th February, 1928. It is admirably concise and is not only in that respect a model report. In about 3,000 words Mr. Sinclair tells us everything of real veterinary importance accomplished by his staff in a year. The text of Mr. Sinclair's discourse—an important text, and a satisfactory discourse—is African coast fever, that dread disease concerning which Koch said, 25 or 30 years ago, that it would sweep Africa and that 90 per cent. of the cattle would succumb to it. The pessimism of Koch is shown to have been unjustifiable by the following account of the work of our colleagues in Southern Rhodesia. It is yet another instance of the futility of those dramatically pessimistic utterances which journalists love to wring from scientific workers.

AFRICAN COAST FEVER.

"A comparison of the mortality schedule with that of the previous year will show that great headway was made in dealing with this disease. This may be illustrated shortly as follows:—

	1927	1928
Number of fresh outbreaks	20	3
Areas on which disease occurred ...	31	4
Mortality	1,344	40

"On the 31 areas carried over as infected from the previous year there were approximately 45,000 head of cattle, and amongst these the total mortality from African Coast fever was one beast. The three fresh outbreaks, which will be discussed more fully later, represent a very slight degree of infection; indeed, in two of them the mortality was two head, that is, one beast in each case. As a result of this marked elimination of infection it was possible to relieve extensive areas from all quarantine restrictions.

"In my annual report for 1921 I made the following observations in regard to a similarly favourable state of affairs:—

"Time after time recrudescences have occurred long after areas had been released from quarantine, and fresh outbreaks have unexpectedly and inexplicably occurred in districts not previously infected. It is necessary, therefore, that there should be no relaxation of the present restrictions and procedure; the greatest vigilance should be exercised by stock owners and the officials of this department in reporting and investigating all cases of sickness or mortality amongst cattle where the cause is not clear. The dipping of cattle as required by the regulations and the early detection of infection will assuredly result in reducing losses to a minimum, and in preventing the widespread dissemination of infection in the unfortunate event of the disease existing at any centre at present unknown and unsuspected.

"Although the position at present is more satisfactory than at the end of 1921, these remarks are as applicable now as they were then.

"The prolonged drought interfered considerably with dipping operations, and total exemption from dipping had to be granted in many areas where there is still a possibility of some infection remaining. Towards the end of the year

good rains relieved the situation, but they also resulted in a heavy increase in tick life before cattle recovered condition sufficiently to enable dipping to be re-started. Complaints have been made from various quarters that the mortality amongst cattle, especially in Matabeleland was largely the result of dipping. In many instances the driving of cattle long distances to dipping tanks and overstocking are the greatest factors in increasing the mortality during the adverse conditions resulting from drought. It is doubtful if the mortality from poverty during the year was as great, relatively, as occurred during the drought of 1912, when there was no general or compulsory dipping of cattle. Complaints have also been made about the hardships and inconveniences arising out of the intensive dipping campaign. It may be pointed out that except in actually infected areas there has been no 'intensive' dipping; the system is one of close supervision to ensure that the provisions of the 'Cattle Cleansing Act, 1927,' *viz.*, weekly dipping of all cattle, are carried out by cattle owners."

There were small losses from anthrax, that ubiquitous disease; quarter-evil, its kinsman; tuberculosis and contagious abortion.

There were 73 ascertained deaths from horse-sickness; it would be interesting to know, roughly, what percentage this figure is of the total solipeds in Southern Rhodesia.

The losses from heartwater in cattle and trypanosomiasis were more serious. Mr. Sinclair's observations on these diseases are quoted in full:—

HEARTWATER IN CATTLE.

"This disease is prevalent in certain areas in the southern and western districts. In several instances a heavy mortality occurred amongst cattle moved from non-infected areas. Cattle bred on the infected areas appear to have a high degree of immunity. Regulations have been promulgated prohibiting the movement of stock from certain areas if infested with the bonttick (*Amblyomma variegatum*). So far heartwater has not been observed in sheep or goats.

TRYPANOSOMIASIS.

"In the Wankie district a considerable mortality occurred in cattle, especially in the Dett Valley, where native owners lost heavily. No cases were reported from the Shangani Reserve, Bubi district, where a large number of cattle died during 1927, but west of this reserve, near the Gwaai River, a heavy mortality occurred. In the Hartley district cases occurred on areas in the Golden Valley not previously affected. In the Lomagundi district a number of cattle died, but no fresh areas appear to have been involved. In the Melsetter district, where tsetse fly has never been found, sixty-eight head of cattle died, the diagnosis in each case being made microscopically. One horse became infected, and is recovering under treatment. Seven head of cattle died on a farm in the Makoni district, in an area where tsetse fly has never been known to exist."

The problem of trypanosomiasis, in its larger aspects, has yet to be solved, so long as the Central and Sub-Tropical districts of Africa are virtually a big game reserve. The scientist can only work effectively in three dimensions; uncontrolled game life is a fourth dimension to the veterinary administrator in tropical and sub-tropical Africa. The veterinary scientist is ready to deal with trypanosomiasis when the people are ready for him to deal with it.

J. W. R.

ABSTRACTS.

[**Transmission of Fowl Pox by Mosquitoes.** KLIGLER, I. J., MUCKENFUSS, R. S., and RIVERS, T. M. *Jnl. of Exp. Med.*, 1929. March V. XLIX. No. 4, p. 649.]

Although the virus of fowl-pox can be transmitted by direct inoculation, numerous workers have found that under laboratory conditions the transference of infection from diseased to healthy birds, which are kept in the same cage, is comparatively infrequent. In consequence, the rapid spread of the disease under natural conditions cannot be readily explained. The occurrence of epidemics in the spring, summer and early autumn and the fact that the lesions appear on exposed parts of the body (comb and wattle) suggest that biting insects may play an important role in the transmission of the disease. In order to obtain information on this question, eighteen experiments were carried out, ten with *Culex pipiens* and eight with *Aedes ægypti*. The mosquitoes were caught in wide test-tubes, the mouths of which were then covered with cheese cloth. After a period of starvation lasting twenty-four hours, the insects were allowed to feed through the cloth on the combs of chickens affected with fowl-pox. The infected mosquitoes were then fed on normal chickens at varying intervals in order to determine the period of survival of the virus. The experiments clearly show that the Culex mosquitoes were able to transmit the disease from infected to susceptible normal chickens.

In seven out of nine tests, infection took place with mosquitoes which had fed 15 mins. to 2 hours previously. In one experiment, infection was produced fourteen days after the insect had taken its infective meal.

The experiments with Aedes were not quite so conclusive. In eight experiments in which the feedings on healthy birds occurred within two hours of the infective meal, two only were positive. Moreover, the lesions were small and rapidly disappeared within a few days. The re-feedings of three Aedes which took place, three, five and nine days respectively after the primary feeding, gave rise to typical lesions. The numerous negative results in this series of experiments were probably dependent on the fact that four out of the six chickens were subsequently found to be either partially or wholly immune.

One experiment was conducted under more natural conditions. Two normal chickens were placed in a mosquito-proof cage with one infected chicken and five Culex mosquitoes were introduced. One of the healthy birds became infected; the other failed to develop lesions, but was later found to be immune. As a control experiment, the test was repeated with three other birds with the exception that the mosquitoes were excluded. The healthy chickens did not become infected, and were subsequently proved to be susceptible.

The suggestion is put forward, that in view of the fact that the virus is active in minute quantities, and is also highly resistant to dessication, the results of the experiments can be explained on the ground that the mosquitoes mechanically transmit the disease and that there need be no multiplication of the virus in the insects.

[The Aerobic Bacterial Flora of the Lochial Secretion of sound Mares 2-8 days after Foaling. SCHWARZINGER, H. (1927.) *Vet. Med. Inang-Diss, Vienna. Abs. B.T.W.*, 44, 43, 715.]

The lochial discharges of 20 mares were examined at 2, 5 and 7 days after parturition. The following bacteria were found:—Staph. albus, staph. aureus, *B. coli*, strep. pyogenes, and *Dip. lanceolatus*.

In the first examination (3 days) few bacteria (staphs.) and an odd leucocyte and red cells were present. Later there was a decided increase in microbes (streps., and a few *B. coli* and diplococci) as well as leucocytes. In the third period the leucocytic picture predominated.

Observations and Investigations on Spirilla as the Cause of Infectious Abortion in the Ox and Sheep. KNUTH, P. and DAVID W. (1928). *Ztschr. f. Inf.-Krkh.*, u. s. w. d. *Haust*, 33, 1-3, 10-34.]

Two sporadic cases observed in cows. The thorax and abdomen of the fœtuses contained a floccular exudate. The spirillum was isolated in culture.

Outbreaks have occurred in herds of sheep, the abortions running to 7-10 per cent., chiefly among younger ewes.

Agglutinins are demonstrable in the blood of aborted ewes 3-4 days after the abortion.

Pregnant guinea-pigs aborted after injection of the spirillum.

From The Veterinarian, June, 1828.

The Use of Camphor in Glanders.
By Mr. W. GARBAND, of Doncaster.

A glandered horse, seven years old, in good condition, belonging to Mr. Marsh, of Deneby, was admitted into my infirmary on the 12th of April.

Symptoms. Offensive discharge from the near nostril in large quantities, and very thick. The Schneiderian membrane slightly ulcerated and much discoloured. The sub-maxillary gland swollen.

From the many successful cases of chronic cough, with discharge from the nostrils, which I have treated with camphor, I was induced to try it in glanders. I gave it in doses of one ounce every day, until the 18th, when the discharge entirely ceased. I syringed the nostril with a strong solution of alum every day, which had a good effect on the ulcerated part of the membrane, and caused the horse to blow out much of the mucus. I fed him on Swedish turnips and hay, with half a peck of oats per day; but he became so rapidly emaciated that I was compelled to change the medicine. I then gave him two drachms of sulphate of copper every day (the same diet) until the 11th of May, when he was discharged, perfectly cured. He has been working since that time, and continues to do well. Two horses had been destroyed for glanders out of the same stable a little time before.

Experiments carried out by the Food Investigation Board have recently shown that there is generally a progressive increase in the tenderness of all joints hung in a temperature of 41 deg.Fahr., that this increase is less marked in the best quality meat, as in loin from prime animals; that coarse meat, such as aged cow beef, is greatly improved by hanging, and that even after 17 days' hanging meat is still perfectly sweet.—*Leeds Mercury.*

DIVISIONAL REPORTS.

Mid-West and South Wales Division, N.V.M.A.

QUARTERLY MEETING AT BATH.

The Spring meeting of this Division, which was held at The Red House, Bath, on Friday, April 19th, 1929, produced a fine rally of members from all parts of this widespread Division. They were rewarded by a most interesting consideration of the important subject of "The Application of Sero-vaccine Therapy in General Practice," very ably introduced by Mr. W. Scott, of Bridgwater. [Mr. Scott's paper, and the ensuing discussion, appear at the commencement of this week's issue of the *Record*.—ED.]

The Chair was occupied by the President (Mr. R. W. Hall) and there were also present Mr. A. S. Adams, Capt. G. D. Atkinson, Capt. W. A. Austin, Capt. J. J. Aveston, Capt. J. R. Barker, Messrs. J. R. Baxter, E. C. Bovett, J. C. Coleman, L. St. Bel Golledge, Capt. J. R. Hewer, Messrs. T. J. Margarson, R. Moore, Capt. J. C. S. Powell, Messrs. W. D. Rees, A. E. Roberts, E. Sayer, W. Scott, J. S. Steward, W. R. Watson, W. Webster, H. C. Wilkins and C. E. Perry (Hon. Secretary), together with the following *Visitors*:—Mr. A. Holman Berry, Mr. A. M. Graham, Capt. T. A. Shaw, and Mr. T. B. Yarrow.

The minutes of the last quarterly meeting of the Division (held at Cardiff in October, 1928), having received publication in the *Record*, were taken as read, and were confirmed and signed.

CORRESPONDENCE.

(1) From Messrs. T. J. Brain, W. T. Edwards, J. L. Perry, J. V. S. Rutter and Dr. W. G. Savage, apologising for inability to attend the meeting.

(2) From Mr. Jacob Golledge, of Trowbridge, requesting the Division to accept his resignation, which he regretted to have to tender, on the ground of ill-health.

The members unanimously decided to ask Mr. Golledge to reconsider his decision to resign from membership.

(3) From Mr. J. Howard Jones, County Veterinary Inspector, Glamorgan, informing the members that he had been invited to accept a Vice-Presidency of the Veterinary Medicine and Meat Hygiene Section of the Congress of the Royal Institute of Public Health to be held at Zurich from May 15th-20th, 1929, and stating that he thought the Division might appreciate such report of the proceedings as he might be able to supply.

The Hon. Secretary was instructed to express to Mr. Jones the pleasure which would be afforded the members by the receipt of the report, and also to convey their congratulations to him on his appointment as Vice-President of Section VII of the Congress.

The Treatment of Sick Animals of the Poor. It was reported that the Council of the N.V.M.A. were awaiting the receipt of further replies from Divisions concerning this matter before taking further action.

Designation of Graded Milks. Mr. COLEMAN reported upon the action taken by the Council of the N.V.M.A. consequent upon the receipt of resolutions from that Division and from the Western Counties Division expressing their agreement with the resolution passed at the Public Health

Congress at Islington, on November 21st, 1928, urging the re-naming of the grades of milk now recognised under the Milk (Special Designations) Order, 1923. At the last meeting of Council, N.V.M.A., said Mr. Coleman, it was unanimously decided to adopt his suggestion that an expression of agreement with the Public Health Congress resolution be sent to The Certified and Grade A (Tuberculin Tested) Milk Producers' Association Conference, which was held at Reading on the succeeding Thursday. The members would be interested and glad to know that he had received a letter from Lieut.-Colonel Maddocks expressing great pleasure at the receipt of that resolution, which had been of great use to the conference and which had been supported unanimously. (Hear, hear.) Colonel Maddocks stated that they had approached the Ministry of Health on three occasions without making any headway, but he now had great hopes that good would come of the resolution. (Applause.)

The HON. SECRETARY said that he had had the pleasure of attending, on their behalf, at the Quarterly Meeting of Council, N.V.M.A., at which that question was brought up, and he could assure them that Mr. Coleman had quite failed to do himself justice in the account of the proceedings which he had just given them. The majority of the members did not appear to appreciate the necessity for any alteration being effected in the milk designations, before Mr. Coleman spoke. Mr. Coleman roused them to a sense of the urgency and importance of the matter, and it was entirely due to him that the resolution was sent forward to the Reading Conference. (Applause.)

Veterinary Biological Products. The HON. SECRETARY reported that, at the meeting of Council, N.V.M.A., the matter of the restriction of the supply of veterinary biological products to members of the profession—which also was raised as a resolution from that Division—was fully discussed. Practically every member present was in full sympathy with them, but the Solicitor told them that nothing could be done, and the Chairman and everyone else felt that, unfortunate as it was, the situation would have to remain as it was at present.

Mr. SCOTT expressed the view that, as the Division had taken a lead in the matter, they should exert all their influence with a view to getting some return for their efforts. It was a matter which should not be allowed to drop, for it was one of immense importance.

Mr. WATSON remarked that he now made a practice of not dealing with any firm which supplied veterinary biological products to people outside the profession.

Mr. SCOTT retorted that that was all very well as far as the individual was concerned, but if they wanted to do anything effectual they must go forward as a body. The real question was, did these firms consider the veterinary surgeon or the layman the more valuable customer? He submitted that if they sat down and did nothing they would have only themselves to blame for the unfortunate sequelæ which would be inevitable. Every country had the Government it deserved, and if they had a "National" which would not move in the matter, he suggested that some Westcountrymen should go to the Council and say that it should be done.

Mr. REES suggested that the question should be relegated to the Council of the Division for consideration, with a view to the drafting of a resolution for forwarding to the Council of the N.V.M.A.

The meeting unanimously agreed to adopt this suggestion.

This concluded the general business before the meeting, and the PRESIDENT now called upon Mr. W. SCOTT, of Bridgwater, to read his paper, "A Brief Survey of Sero-Vaccine Therapy: Its Application in General Practice." A good discussion followed, Captain G. ATKINSON opening most effectively.

At the termination of the essayist's reply, the PRESIDENT, from the Chair, moved that a hearty vote of thanks be accorded Mr. Scott for the most interesting and instructive paper he had presented to the Division that afternoon; also that a similar tribute be paid to Captain Atkinson for his excellent address as opener of the discussion.

The motion having been passed with acclamation, Captain AVESTON drew attention to the fact that one of their members—Captain J. R. Hewer—had had conferred upon him the honour of the Presidency of another important Division of the N.V.M.A., *viz.*, the Royal Counties Division. He was sure that they all desired to congratulate Mr. Hewer very heartily upon his election to the Presidential Chair of that Society. (Applause.)

In acknowledging the compliment, Mr. HEWER expressed the pleasure that it would afford the officers and members of the Royal Counties Division to welcome any members of the "Mid-West" who might be able to attend their meeting at Guildford that day week.

New Member. On the proposition of Mr. COLEMAN, seconded by Captain AVESTON, Mr. T. B. Yarrow, of Swindon, was unanimously elected to membership. In seconding, Captain AVESTON urged those present to put forth every effort to secure additions to their membership. They had many young men resident within the great area covered by their Division, and he felt that they were not coming forward, as they should, to fill the vacancies caused by the inevitable losses sustained from time to time by death or removal of the older members.

The HON. SECRETARY informed the meeting that the names of 82 members were on the books of the Division at the present time. He took it that Captain Aveston would bring the matter up at their next Council meeting for discussion as to ways and means of securing new members.

Mr. SCOTT proposed a hearty vote of thanks to the President for his conduct of the meeting. He was delighted—and was sure they all were—that such a good meeting should have coincided with Mr. Hall's first appearance in the Chair. (Applause.)

The PRESIDENT, returning thanks, expressed the hope that both attendance and discussion would be as satisfactory at their next meeting, which would take place at Barry, his home town. He desired to take that opportunity of extending a warm welcome to Mr. Holman Berry and the other visitors, whom they were delighted to have with them.

Before dispersing, the members followed their invariable practice of taking tea together, which adds much to the enjoyment of the meetings of this Division as occasions for social intercourse.

C. E. PERRY, Hon. Secretary.

West of Scotland Division N.V.M.A.*

A meeting of the West of Scotland Division of the N.V.M.A. was held at the Royal Hotel, Sauchiehall Street, Glasgow, on April 24th, 1929, at 6-30 p.m.

In the temporary absence of the President, who came in later, the Vice-President, Mr. Peter Meikle, took the Chair, and the following members were present :—Messrs. Donald Campbell, Andrew H. Stark, James F. Taylor, W. Harley, J. G. McGregor, A. Sillars, P. Wilson, P. Meikle, J. M. Donald, James Macfarlane, J W. Emslie, T. Johnston, A. W. Whitehouse, and G. W. Weir. *Visitor*: Mr. T. W. Stobo.

The minutes of the previous meeting were read and, after a slight amendment, approved.

The balance sheet for the year 1928, as audited, showed a balance of £24 18s. 7d., and was approved.

It was moved by Mr. CAMPBELL, seconded by Mr. STARK, and agreed, that the Division forward a contribution of £5 to the Victoria Benevolent Fund.

DISCUSSION ON REPORT OF DEPUTATION TO HEALTH COMMITTEE OF MIDDLE WARD OF LANARKSHIRE.

Mr. CAMPBELL reminded members that a deputation consisting of himself and Mr. P. Meikle waited on the Health Committee of the Middle Ward of Lanarkshire on March 6th, 1928, to urge that the County Council should recognise any veterinary surgeon as a competent party to carry out the test required by the Milk (Special Designations) Order; that the Health Committee had received the deputation not unfavourably, and had remitted the matter to a special sub-committee for further consideration and report. As far as he knew, this sub-committee had not yet reported.

Mr. P. MEIKLE had interviewed members of the sub-committee and observed that there was a feeling favourable to practitioners doing the testing under the general supervision of the County Veterinary Officer. He read a series of recommendations for adoption by the Division to be forwarded to the sub-committee, but these were not persevered with.

Mr. MACGREGOR reported the conditions in Stirlingshire, and suggested that the Division approach the Department of Health for Scotland with a view of opening the whole question of Tuberculosis Eradication. The following resolutions were moved by the President, Professor G. W. Weir, and seconded by Mr. Campbell :—

(1) That the West of Scotland Division of the N.V.M.A. is still of the opinion that it would be in the public interest for County Councils to recognise all duly registered veterinary surgeons as competent parties to carry out the tests required under the Milk and Dairies Act.

(2) That the Secretary be instructed to forward a copy of the above resolution to the Clerk of the Lanarkshire County Council, asking him to transmit it through the proper channels to the Special Sub-Committee appointed by the Public Health Committee of the Middle Ward to consider the Memorandum submitted by the deputation from the West of Scotland Division of the National Veterinary Medical Association and to intimate that a reply would now be acceptable.

The resolutions were carried unanimously.

* Received on 13th May.

Mr. McGregor suggested that the next meeting be devoted to evolving in proper form a resolution on Tuberculosis Eradication, to be forwarded to the "National," and it was decided that Mr. McGregor should open with a paper on the subject on some convenient date a month from now, and that Professors Trotter and Gofton be specially invited to attend and present their views.

A vote of thanks to the Chairman terminated the proceedings.

A. W. WHITEHOUSE, *Hon. Secretary.*

REVIEW.

CATTLE MANAGEMENT.

This little text book for use in Native Schools in Africa is written by Mr. J. R. Fell and Mr. R. A. S. Macdonald, B.Sc., M.R.C.V.S. In simple language it discusses the uses of cattle, practical points in breeding—emphasis being laid on the value of a good bull—the care and feeding of adult animals and calves, and concludes with a brief description of some of the more important diseases with advice on simpler first-aid. There are a number of excellent photographs of pedigree British stock. The importance of cattle to the African cannot be overestimated and any attempt to seek to improve these animals and to maintain such improvement should prove of considerable value and is a step in the right direction.

T. W. M. C.

The Journal of the Royal Army Veterinary Corps.

The Committee of Management of the *Journal of the Royal Army Veterinary Corps* acknowledge with thanks receipt of subscriptions to that publication, from the undermentioned :—

1ST LIST.

Major-General Sir Layton Blenkinsop, K.C.B., D.S.O.; Colonel D. Bolton; Veterinary Major B. R. Body; Major J. A. Boseley; Major R. F. Bett; Captain P. Braid; Captain H. B. Collett; Lieut.-Colonel P. W. Dayer Smith, O.B.E., T.D.; Captain J. Daunt, M.B.E.; Major G. W. Godwin; Lieut.-Colonel H. E. Gibbs, D.S.O.; Major R. A. Gooderidge, O.B.E.; Major H. J. Holness, D.S.O.; Major F. Hogg; Major E. Hearne, O.B.E.; Major J. B. A. Hare; J. Ewing Johnston, Esq., M.B.E., J.P.; Major R. H. Knowles; Major M. J. Killelea; Lieut.-Colonel B. L. Lake, D.S.O., O.B.E.; Major H. D. Lewis; Major-General Sir John Moore, K.C.M.G., C.B.; Major R. W. Mellard, D.S.O.; Major E. S. Oliver; Major L. P. Pugh; Mr. C. Richardson; Captain R. Scott; Major C. J. Saunders, D.S.O.; Captain L. R. Swifte; Major H. Stephenson, M.C.; Major W. S. Stevens; Major-General Sir Fredk. Smith, K.C.M.G., C.B.; Major C. M. Stewart; Colonel A. G. Todd, C.B.E., D.S.O.; Major E. G. Turner, D.S.O., and Major W. H. Thomas.

Army Veterinary Service.

Major H. J. Hughes, M.B.E., arrived home from China on the 25th May, 1929, and has been posted to the Aldershot Command for duty.

LONDON GAZETTE—WAR OFFICE—TERRITORIAL ARMY.

May 21—Maj. T. Dalling is ret. on reduction of estabt. (March 31).

May 24—Maj. A. Robb, T.D., retires on reduction of estabt. and retains his rank, with permission to wear the prescribed uniform (March 31).

TERRITORIAL ARMY RESERVE OF OFFICERS.

Maj. H. Sumner, from Active List, to be Maj. (May 25).

XUM

NOTES AND NEWS.

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events.

Aug. 31st to Sept. 6th.—N.V.M.A. Congress at Ayr.

June 3rd.—Meeting of the Editorial Committee, N.V.M.A., 10 Gray's Inn Square, W.C., 4-30 p.m.

,, 6th.—R.C.V.S. Annual General Meeting, to be followed by Annual General Meeting of the Victoria Veterinary Benevolent Fund. Meeting of the Central Division, N.V.M.A., 6-30 p.m. All at 10 Red Lion Square, W.C.

,, 6th.—Annual General Meeting of the Scottish Society of Veterinary Inspectors, at the Glasgow Veterinary College, at 2-30 p.m.

,, 8th.—Meeting of the North of England Division, N.V.M.A., at the Imperial Hotel, Darlington, at 2-30 p.m.

,, 14th.—R.A.V.C. Annual Dinner.

,, 17th.—D.V.S.M. Examination commences in Edinburgh.

July 3rd.—R.C.V.S. Annual Dinner.

,, 4th.—R.C.V.S. Committee Meetings.

,, 5th.—R.C.V.S. Council Meeting.

,, 9th.—R.C.V.S. Written Examinations.

,, 11th.—R.C.V.S. Oral Examinations begin.

London University O.T.C.: Artillery Section R.V.C. Sports.

The Annual Sports were held at the Duke of York's Barracks on Saturday, 25th May, and the number of entries for the various events proved satisfactory. As far as the Veterinary College was concerned, the main feature of the day was the "tug of war." Unfortunately, owing to injuries to two members of the team, substitutes had to be obtained on the ground. In spite of this handicap, the team pulled magnificently, and fought their way into the final where, however, they were beaten by a heavier and more experienced side.

The R.V.C. did, however, gain a notable success in the winning of Lieut. FitzGerald's cup for Horsemanship, which was secured by Sergt. Sherriffs.

Personal.

Tribute to Mr. Alex. Pottie.—At the last meeting of the Renfrewshire County Council, a letter was received from Mr. Alexander Pottie, County Veterinary Inspector under the Contagious Diseases of Animals Act, requesting to be relieved of his duties as at May 15th.

The Chairman expressed his appreciation of the services which Mr. Pottie had given to the Council during the past quarter of a century. He was well-known and respected, and carried out his duties faithfully, and to the satisfaction of the Council, and he desired that that should be placed on record.

The Chairman's remarks were endorsed by other members.

. . . . . .

Wills.—Carter, Mr. George William (75) of Stone Dene, Knaresborough, veterinary surgeon (net personalty, £5,983), £6,018.

Golledge, Major Charles Hedworth, R.A.V.C., of Holywell House, West Coker, Somerset (net personalty, £28,012), £31,167.

New Type of Abattoir.—The first public abattoir constructed in the British Isles in which animals are laired and slaughtered on meat works principles, and in which the carcases are hung in a temperature which is artificially controlled all the year round, was opened in Sheffield recently by the Minister of Agriculture and Fisheries (Mr. Walter Guinness). In connection with the abattoir is a wholesale meat market. The whole scheme has cost the Corporation £330,000. The Minister of Agriculture said that marketing reform was of great value to British farmers. They were hoping to introduce the same grading methods for meat as they had introduced in the case of eggs. It was necessary to start on an experimental scale, and they were hoping to make a beginning in London at Smithfield.

CORRESPONDENCE.

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

All correspondence must bear the name and address of the contributor for publication.

The Editor does not hold himself responsible for the opinions of his correspondents.

The Financial Aspect of Country Practice.

To the Editor of The Veterinary Record.

Sir,—Mr. Delacherois wonders why he cannot sell a country practice turning over £600 a year. I can tell him. A practitioner turning over £600 a year has to work hard and has practically nothing left after expenses have been paid, and it is a dog's life. The farmers grumble at their bills, and expect the veterinary surgeon to be at their beck and call at all hours. They frequently pay their veterinary surgeon after three or four years.

The fault is not so much with the farmer, however, as with the profession. I so often hear that a farmer grumbles at a reasonable fee and says that Mr. so and so—a practitioner many miles further off—will do it for less. This, alas, is true.

The remedy is co-operation in the profession, not competition.

My suggestion as to a remedy is that the Royal College of Veterinary Surgeons should draw up a minimum scale of fees, and that it should be considered unprofessional conduct to charge and take less. If a client is not in a position to pay a minimum fee, give him the assistance he needs and consider it an act of charity.

Night work should be heavily charged, as 95 per cent. of this is unnecessary, and only occasioned by the owner using quack remedies for hours or meddling with the case, himself unskilled, till he gets tired of it about midnight.

An arrangement of this sort, duly published in the daily papers, and in the agricultural journals, would very shortly improve matters and there would be plenty of young men who would gladly take country practices. If something of the kind is not done Mr. Delacherois is quite right—there will in time be no veterinary surgeons available for this class of practice. I am quite unprejudiced, as I do not practise myself, but see a lot of practise all over the country.

Faithfully yours, Bernard H. Benson.

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The Editor acknowledges the receipt of the following:—Communications from Mr. G. B. Brook (London) and Major G. Rees-Mogg (London).

Report of the Director of the Abattoir and Live Stock Market Department, City of Johannesburg, for the period from 1st July, 1927 to 30th June, 1928.

SIR RALPH JACKSON, M.R.C.V.S.,
Chief Veterinary Officer, Ministry of Agriculture.